

A SECOND
ESSAY ON BURNS,

In which an Attempt is made
 TO REFUTE THE OPINIONS

OF

MR. EARLE, AND SIR W. FARQUHAR,

Lately advanced, on the supposed Benefit

OF THE

APPLICATION OF ICE IN SUCH ACCIDENTS:

With Cases and Communications,

CONFIRMING THE PRINCIPLES AND PRACTICE

BROUGHT FORWARD IN A

FORMER ESSAY.

Also PROOFS, particularly addressed to

SURGEONS OF THE ARMY AND NAVY,

OF THE UTILITY OF THE STIMULATING PLAN
 IN THE TREATMENT OF INJURIES CAUSED BY THE EXPLOSION
 OF GUNPOWDER.

By **EDWARD KENTISH,**
 AUTHOR OF THE FORMER ESSAY.

“ Fire cools fire,
 “ Within the scorched veins of one new burn'd.”
 SHAKESPEARE.

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Newcastle

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A SECOND

ESSAY ON BURNS, &c.

INTRODUCTION.

CHAP. I.

Preliminary Observations—Aitken's System of Surgery—Effects of Systems—Conversation concerning the new Mode of Treatment—On the Unity of Medicine and Surgery—External and internal Diseases intimately connected with this Principle.

IN the former Essay on Burns, I entered somewhat at large on the different and inconsistent modes in which accidents of this kind were treated. It appeared to me that I had said enough ; and there were those who thought I had said too much : yet, from opinions lately published, it does not appear that what was done has produced the effect I wished, in influencing the practice in these cases, and in leading to those decisive and *marked* conclusions, which ought to be kept in view by men of science. It has frequently been wished by many candid

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practitioners, that *nature* had so marked the beginning of every disease, as that we might with certainty predict the future from the present; and that the reputation of a great physician might not be included in the term—a *lucky guesser*: but had even this been the case, what certainty have we that our art would have been much more advanced? Is not the phænomenon which I am investigating one of the most palpable we can conceive of cause and effect; and is there one in which, since the earliest records of our art, there is more contradiction, or less certainty? To what are we to attribute this unaccountable discordance in a matter which is daily happening, (and wonderful to tell!) which every old woman thinks herself capable of treating? Perhaps this interference, and in some cases the superiority of the *old woman's* recipe over the *routine* of the *young artist*, may produce such disgust as to prevent him from paying due attention to the most interesting processes of the animal œconomy. By way of illustrating this matter let us suppose a well educated (as it is termed) young practitioner, who may have studied at Cambridge, Oxford, London, or Edinburgh, either with M.D. attached to his name, or not, as you please. Being called to an accident of this kind, from the few cases he has seen in the hospitals he is undetermined in the mode of treatment, but goes home

home and consults in his closet the Elements of Surgery by John Aitken:—

LIV.

“ Combustura,	} of the Latins.
Encaufis,	
Ambustio,	
Aduſtum,	
Brulure,	of the French.
Burning,	} of the Engliſh.
Scalding,	

Phlegmone, whoſe occaſional cauſe is heat.

LV.

“ Organifed matter of every kind, eſpecially the animal body, may be altered, or totally deſtroyed by the action of fire. It is the moſt ſtimulant of all the occaſional cauſes of phlegmonic affections. Thoſe which it excites are, however, not ſpecifically different from inflammations induced by other means. Their violence and extent are in proportion to the quantity acting, the continuance of its application, and the nature of the parts it affects.

LVI.

“ Fire may be accumulated in bodies nearly in the degree of their denſity, and ſolidity; in oil therefore, more than in water, and in earths, and metals more than in either. Conſequently the quantity of fire which has acted as an occaſional cauſe of phlegmone may, in ſome meaſure, be eſti-

mated from the density of the medium through which it was applied, and the degree of accumulation and continuance.

LVII.

“ Burning, like all other morbid affections, requires curative attention in proportion to its quantity. Sometimes it is superficial, and circumscribed, covered with vesications; at other times profound, extended and encrusted. It proportionally excites symptomatic fever, (XXXVI.) frequently to a fatal pitch. It may suffer any of the ordinary terminations, (XXIII. XXIV.) the suppurative one, for obvious reasons, can seldom assume the form of abscess. (XXIII.)

LVIII.

“ The combined effects of the general and topical antiphlogistic remedies (XLV.) are necessary in the cure of the more severe burnings. The exquisite increase of sensibility not only forbids the external use of any stimulant matters, but, on the contrary, demands the most bland and soothing coverings.

“ Is not opium peculiarly indicated? Are not *ardent spirit*, sugar of lead, and lime water likely to prove hurtful external applications?”

He determines from this account in the System of Surgery to apply oil in which opium has been dissolved, and some very *smooth bland* ointment;

ment; and to complete the treatment upon the same principle, orders bleeding *ad deliquium* (or fainting) and a strong purge with low diet afterwards. How would he be shocked to hear from the by-standers the proposal of washing the parts with spirit; and to take a little internally would offend his *prejudices* still more. Should they persist, false scholastic pride would prevent his benefiting from this *experiment*, and he would leave them with an *Anathema*. The crimination and recrimination from such conduct is easy to be conceived, and I leave them to the imagination of my reader.

In an experimental science, in which *chance* has given the most valuable of the facts we possess to the cultivators of our art, arrogance should be banished; and it is our duty to receive and investigate all the evidence we can possibly collect: we may then class the phenomena under different heads, and reduce them to that unity of principle which so beautifully governs the actions of the living animal system. It requires some philosophy to be thus schooled; but the most valuable of our acquisitions frequently arise from such a source. To prove that I am not preaching without practising, I refer the reader to a case I communicated to Dr Beddoes, in the Medical Contributions; he will see that I have had a lesson in this school. I now confess it was not the only one. During the time it is not plea-

fant, but there are great benefits arising from it ; and as we are mere creatures of habit, each repetition is more easy, and perhaps more beneficial.

- In looking over what Aitken has said upon burns, we see in a strong point of view the *errors* that must be committed by all *system* writers ; they are obliged to enlarge upon all parts of a science ; but to comprehend the whole is more than the limited mind of man is capable of. Aitken had a vigorous intellect, and had he been placed in proper circumstances, there are few men who would have sooner detected error than himself ; but he has written upon this subject as many others have done, with *little* experience and *great* prejudice. Would men in general confine their efforts to a few points, science would make a more rapid progress, though there might be less brilliancy attached to individuals. It is by a division of labor that perfection is to be attained in the scientific, as well as in the mechanic arts ; and were we *truly* to appreciate the matter, we should be convinced that there is more credit in elucidating *one* uncertain point in the practice of medicine or surgery, than in loading many clear points with a farrago, which, by the inexperienced, cannot be distinguished, and of which the bad is as likely to be chosen as the good. Thus may error become perpetual.

Mr

Mr Earle's pamphlet convinces me that mine upon the same subject is not much known, and is, I hope, a sufficient apology for troubling the public with this second essay. Perhaps the following conversation between Dr Blane, Dr Johnston, and Mr Bell, when the latter was examined on his qualification as a surgeon for the navy, will be still more convincing: "Having mentioned scalds and burns among the accidents during our cruize, Dr B. said, 'pray, sir, how did you treat them?' I replied, 'by bathing the affected parts with oil of turpentine.' 'Oil of turpentine! Good God, sir! that is a practice I must condemn in the severest terms! and I think *you*, Dr Johnston, will agree with me in reprobating it.' Dr J. said, he never heard of such a remedy before, but asked on what principle, or theory, I could justify it? I said, 'that when a person had any member so much exposed to severe cold as to become *frost-bitten*, it was usual to apply, first snow or ice, and afterwards cold water, before any degree of sensible heat could be borne without injury; that, for the same reason, when a part had been violently stimulated, it was equally necessary to bring it by degrees down to the healthy standard; that this object was best accomplished by the application of a stimulus a little less violent than that which had caused the diseased action; and, that the Ol. Terebinth.

had been found by experience equal to produce that effect.' 'On what experience?' said Dr B. 'On that of Mr Kentish, of Newcastle, who has written an essay on the subject, in which the superiority of this method of practice is proved beyond a doubt, at least in my opinion.' Dr B. 'Does it (meaning the Ol. Terebinth.) not produce great pain?' Ans. 'Not in the least; on the contrary, it is soothing and agreeable to the patient.' I then narrated to them the case that Mr Anderson communicated to you; that of the child I noticed in my former letter; and also the innumerable cases I had seen while with you, where the patients were *flayed* from head to foot."

The above was written to me immediately after his examination, which he passed with great credit to himself, being deemed eligible for the highest situation in that department. When I hear of men of such established reputation being unacquainted with the facts upon which I have grounded my practice, and knowing that conviction upon this point must cause a very considerable revolution in their opinions on many other *important* parts of their practice, I feel anxious that a more general circulation should be given to the conclusions drawn from the facts adduced in my essay;—that if well founded, as I believe them to be, they may do good: if erroneous, the sooner they are refuted the better.

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The above is not meant in the slightest manner to reflect upon either Dr Blane or Dr Johnston ; on the contrary, the compliment they paid to Mr Bell in his qualification, shews they were pleased with his information, and that they heard his facts with that candor with which men of great minds are ever ready to receive the lessons of nature, even though they contradict the lessons they have been taught at school, the acquiring of which cost them so dear, and to part with them no less an effort ; but “amicus Plato, sed magis amica veritas.”

I must confess I have found great aid in the whole circle of practice in *external medicine* from the application of these principles ; and I hope at a future period to be able to bring forward some striking facts, affecting the present practice in as great a degree as this treatment of burns compared with the old authors.

I use the term *external medicine* with a view of pointing out the unity of this science, and that to divide it is impossible. That an individual may devote himself to a particular part of practice is true ; but if he be ignorant of the vital powers of the system upon which he works, he is unfit to exercise the art of healing, and should not bear any of its appellations. If adequate, the name should be the same to all. It was the Arabian physicians, who were in general great lords, courtiers,

tiers, or at least wishing to be such, in the eleventh century, that attempted to introduce a class of men to perform those functions which their own pride and laziness prevented them from fulfilling. Such an attempt would have partisans both for and against, and it was some centuries before the division of doctors and surgeons was fully established. The distinction has remained ever since, and many disputes have arisen between these classes, concerning the supposed priority or superiority of the one over the other, sometimes carried on with a disgusting acrimony, at others with a childish absurdity. To restore them to what they formerly were, i. e. to reunite them, may require ages to come ; but after vacillating for some time, reunion is the point in which they must rest.

The art of restoring health is one ; the principles of action are the same, and the exercise of the different branches supposes the same fundamental knowledge. The accident of which I treat could not have been carried to that degree of certainty or perfection, merely by external means ; nor do I assert more than what I believe, when I say, that I have received great advantage in the treatment of internal diseases from my attention to these external processes, where nature works in view. Should the principle be admitted in these extremes of heat and cold, (see First Essay, p. 103.) we may also gain some light when the balance of the system

is less broken ; for there are a great number of diseases which take their rise from a change of temperature, and there are *none* which are not influenced in their course by the modifications of heat and cold ; and even in the present advanced state of our knowledge, there are few subjects of which we know less than the effects of different degrees of heat upon the living body. For how many ages has it been repeated by the faculty, and believed by the public, that warm baths are debilitating ? What a combination of relative ideas are necessary to determine this assertion ! and even when determined it could only be relative to an individual, as different habits and circumstances might reverse the opinion. The public are indebted to Dr Beddoes for removing a considerable degree of prejudice which they had against warm baths ; their utility in pulmonic complaints begins to be apparent, and I have no doubt in a little time they will come into very general use. As an agent, much may be done by them to assist medicine and restore healthy action.

From what has been already adduced, I trust the importance of the investigation in which I am employed, will be apparent, as will also the connecting medium of all the phænomena of the system, which in this resembles our portion of sensibility, that not
one

one part of it can be affected without the other feeling a consentaneous sympathy.

CHAP. II.

Mr Earle's Pamphlet on lessening the Effects of Fire, &c.—Apology to Mr E. with Observations—Cases related and quoted by Mr E. with Remarks—Case of a Lady under the Care of Mr Farquhar, now Sir Walter Farquhar, M. D. related by herself—Free Remarks upon this Case, shewing the Sources of Delusion in Medicine—Opinions on the Doctrine of Heat, &c.—Case by Mr Anderson, of Newcastle, in which the paralyzing and stimulating Practices were both used on the same Subject, at the same Time—Remarks arising from this Case—Remarks by the Reviewers—Cold recommended by others—Mr S. Lowdell—Also some Cases by Mr Thos. Parkinson, with Remarks.

AN Essay intituled the Means of lessening the Effects of Fire upon the Human Body, from the pen of Mr Earle, bearing a very recent date, (Nov. 16, 1799,) having come to my knowledge through the channel of the Medical and Physical Journal, I anxiously procured the work. It would appear from this tract, that my essay upon the same subject

subject had not fallen into the hands of Mr Earle, although it had been published near three years previously to his, and had gone through the routine of reviewers both medical and literary : for as I have therein endeavoured to maintain a theory and a *practice* founded on incontrovertible facts, diametrically opposite to those wished to be established by Mr Earle, I have no doubt he would have noticed my essay had it come within the sphere of his reading.

I have not the pleasure of Mr Earle's acquaintance, and I hope he will excuse any liberty I may appear to take in criticising the principles of his essay, as nothing personal can be meant : but in a matter of such importance, where the interests of humanity are at stake, in fixing the rules of surgery on the broad basis of the immutable laws of nature, silence or false delicacy would be highly criminal.

The art of surgery has been necessary since the creation of man, and the laws of the animal œconomy have always been the same ; but the knowledge of these laws is even yet partial and imperfect. Some of them have been seen darkly by some observers ; but even those glimmerings have vanished with the individuals, so that in a great measure each person has had to go over the same ground : but in these later times, since the art of writing, of printing,

printing, and more particularly now, that the mode of accumulating detached facts in periodical publications has taken place—a mode which renders them works of inestimable value—a mass of evidence will be collected, from which the simple laws of the animal œconomy may finally be made apparent. In drawing conclusions from such documents, it will be necessary that we ourselves be placed in such circumstances as to be enabled properly to appreciate the value of the evidence; for on the proper use of these means depends the advancement of our scientific art. A fortuitous concurrence of events has placed me in such a situation as leads me to think myself capable of arriving at some useful conclusions. The thought is sufficient to induce the attempt; concerning the execution, I must trust to the opinion of those capable of forming a just one. Having made these preliminary observations, I shall proceed to revise some of the theoretical and practical doctrines of Mr Earle, as given in his essay.

He begins by lamenting the want of principle in the treatment of such accidents as happen from the influence of fire upon the human body, both in the ancient and *modern* authors upon this subject: he likewise notices some of the most common and contradictory applications, and adds that many more formulæ might be enumerated; that in general they

they are intended to cool, relax, or give ease ; and that in some measure they answer these purposes, but do not furnish effectual means to stop the progress, or lessen the powerful action of the *matter* of fire, which probably continues to *exist* in the burnt part, and to extend its influence for some time. This opinion of the matter of heat I have mentioned in my former essay, (page 125) speaking of Fourcroy's recommending the fluor volatile alcali as an application to burns, which he supposes may unite with some disengaged matter of heat, previously to its having time to combine with the animal fibre. Chaptal appears to be of the same opinion ; but I have there ventured to dissent from these enlightened chemists, looking upon heat as an effect produced by the motion of the particles of matter changing their state from a gaseous to a liquid, or a solid form. But whether it is a material body, or only the effect of chemical changes in other bodies, seems to be of little consequence in the present disquisition : let this abstract question be determined by the chemists. When they shew me the matter of heat palpable to the senses, in a fixed state, I shall be a convert ; until then I may perhaps remain a sceptic. We need only observe its effects as influencing a series of actions in the animal œconomy, actions which differ according to the degree of heat, and its duration,

duration, following the laws of animated nature. All other than these effects are incapable of proof, and may lead us wrong, therefore should be avoided.

The first case Mr E. relates is one which happened some years ago to a medical gentleman: being near a bottle of spirit of wine, which was imprudently heated, and by some accident caught fire, the bottle burst and the contents were thrown over his hands, face, and the upper part of the neck, all of which were miserably burnt. "At a consultation," says Mr Earle, "on this unfortunate case, the usual modes of treating burns were discussed; and from a thorough conviction of the little good to be derived from the applications in common use, it was agreed that after the loss of some blood, cold water alone should be applied to bathe the parts; and this being found to give ease, was constantly renewed; and the patient during several days *drank* nothing but *cold water*, and took *very little* nourishment. By these means he was kept in a cool and *tolerably* easy state, though the pain *often* returned at short intervals; some blisters arose, which however in *little more* than a week subsided, and no scar was produced."

After this case, Mr E. narrates that of the illustrious Boerhaave, which happened from the bursting of Papin's digester. It was treated by profuse
bleeding,

bleeding, purging, low diet, and externally by the softest oily applications to be found in the shops. It was cured after a tedious suppuration, and with an unsightly scar. It is here brought into parallel, with a view to shew the superiority of *cold* applications over unctuous or greasy ones, as in every other respect the treatment was nearly similar—bleeding in both, cold drink, and very little nourishment.

I wish this case of the medical gentleman had been drawn up with more exactness. The expression, "*some blisters* arose, which however in *little more than a week subsided*, and no scar was produced," is indefinite in respect both of time and matter. It may mean the *blisters* subsided in little more than a week, and when the *sores* were healed there remained no scar. But the healing of the sores might be some time after the subsiding of the *blisters*. From the observation at the beginning, "when, some years since, I was sent for to a medical gentleman," it would likewise appear that this case had been drawn up from memory. Now as the recollection of a case *some years since* can only be general, the particularities must have escaped, and would if narrated perhaps have given a different shade to the whole. I do not mean to impute a wish in Mr Earle to mislead; but when a medical man taxes his memory for cases to support a particular doctrine, he seldom admits any

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intrusive

intrusive facts which would weaken the conclusions he wishes to draw. I have likewise quoted this case of Boerhaave's in my essay (vide p. 30,) and have wished it to be brought into comparison with the treatment of a similar accident which happened to a medical gentleman (Mr Hopper) at that time my pupil, (vide page 162, former essay) under my own care; the whole of which was drawn up at the *bed-side* of the patient, relating his feelings, and conducted on principles drawn from extensive observations in similar cases—principles which were developed to me from the result of my own mistakes, and which by their *force* and *truth* insinuated themselves into my mind, contrary to my routine, my prejudices, and even my interest. I wish these cases to be compared, for in my own mind nothing more satisfactory as evidence can possibly be adduced; and there the progress of mind from error to truth may be traced.

I have wished in my essay to bring into comparison those extensive injuries only, where life or death would be the result of different practice. Such cases have been related; and if from experience I am enabled to assert, that a case will terminate in the loss of life, or the restoration of health, according to the mode of treatment pursued, I think I may fairly be allowed to conclude, that a procedure upon the same principle in injuries which would not affect existence, would have a proportionate

tionate degree of superiority over those which would extinguish life were it primarily in danger. To have advanced thus far appears to me to be as much as can be expected in a *conjectural art*, even if it does not place it on a *firmer* basis, and rescue it from that *opprobrious title*.

After a display of this case, in which cold water produced such effects, Mr Earle confesses, “though this plan well followed up and renewed as often as possible, lessened the pain, and abated the heat, it did *not quickly subdue them*; and in large and severe burns it seemed *disproportioned* to the violent effect produced by the fire.” The next case related is that of a lady who had her neck and face much injured, from the burning of her neckerchief. There was a consultation on this case, at which Sir Walter Farquhar was present. He proposed the application of ice to all the burnt parts, although they were very extensive. Mr Earle’s predilection for cold applications induced his immediate assent, and ice was accordingly applied; which *appearing* to give immediate ease, was continued unceasingly during several nights and days; after which the lady recovered without any scar remaining, or any injury to her health from the cold state in which she so long remained. This case is evidently, as was the last, drawn up from recollection, and little can be gathered of the state of the lady from what is

related : that she had ice applied to her for several days, and that she avoided any ill consequence from it, we are told; as also that she afterwards, i. e. I suppose, after they ceased applying what is termed the remedy, recovered without any scar remaining. But of what did she recover? Were the parts blistered, or were they destroyed? Was there sloughing, or a purulent discharge (secretion) from the skin; and how long *after* was it before she was well? Of all these particulars we are uninformed, and without such information no just judgment can be made. It perhaps is one of the most difficult parts of a professional author to convey *precise* statements of particular actions in injuries happening to individuals under their care; but here there is no attempt of the kind; every thing is rounded off by general assertions.

A child of Mr Earle's, about three years of age, playing with his brothers, was thrown down upon the hearth: to save himself, he caught hold with one hand of a hot bar of the grate. His father saw him in less than a quarter of an hour after; he was in exquisite pain, although the nurse had wrapped his hand in oil; ice was instantly sent for, with which his hand was covered, and he got immediate ease; but as soon as the ice was melted, which was at first in a short time, the pain returned, and he cried out for more. A *blister* arose,

[*This*

[*This shews that ice will not prevent the rising of blisters.*] which, by degrees, in one large bladder occupied the whole of the palm of the hand, and the inside of the thumb and fingers, and it increased so as to become globular, and nearly of the size of a hen's egg. The opening or breaking of this was most carefully avoided; and ice was constantly applied to the whole hand, it being immersed, during the day in a basin of ice and ice water, and at night wrapped in cloths, or covered with scraped potatoes, soaked in it. Whenever this application was recent, the child was easy and slept; but at intervals, as the hand grew hot from the melting of the ice, he became restless, and cried until it was renewed, when his sleep was again composed. This plan was pursued during a week, at the end of which, an absorption of the extravasated lymph took place; the cuticle which had been elevated to so great an extent, began to shrink and shrivel; in a few days it became ragged and torn, and was taken away without any painful sensation, a perfectly well healed surface appearing underneath.

This case, it appears, had been attended by Sir Walter Farquhar, to whom Mr Earle expresses his acknowledgments for his kind attention, also for being the first who suggested this mode of treatment. Their conversations frequently turned on the efficacy of the means employed, and

they mutually regretted that this practice was so little known. This seems to have induced Mr Earle to take up his pen upon the subject. He makes the following observations upon his son's case: "If I am allowed to judge from the severity, and situation of the burn, and from the soft and tender structure of the parts concerned in the case just described, and to reason from what I have seen in many others, I am decidedly of opinion that, had it been treated by *any* of the means commonly employed, the inflammation would have risen much higher, and continued much longer; consequently the pain would have been more severe, and of longer duration, accompanied with fever. From the greater degree of heat, and irritation, the blister would have continued to increase, and, if the intentional opening of it, which by some was advised, had been avoided, it would have burst; the admission of air would have produced a slough, in which the tendons would have been implicated; in consequence the muscles, no longer serviceable, would have become contracted, and the hand for ever been left maimed and useless."—Such are the conclusions attempted to be drawn from this case: I must confess the premises do not appear to warrant them; I must therefore beg leave to draw the reader's attention to some of the facts as stated above, from which I shall be induced to draw

draw very opposite inferences. It is said, “ a *blister* arose, which, by *degrees*, in one large bladder, occupied the whole of the palm of the hand, and the inside of the thumb and fingers.”—From this it appears that the extravasation of lymph had not taken place when the ice was first applied. I should therefore conclude that ice applied to a burned part will not excite the absorbents so as to keep up the equilibrium of action between them and the stimulated exhalents, upon which, in this state of the irritated surface, chiefly depends the cure. I have frequently seen vesications quickly reabsorbed by the use of the strongest stimulants; and in general blisters are prevented from forming after their application. From seeing such effects from known and demonstrable causes, I cannot but suppose that they must arise from some certain laws of the system; and as nature has allowed herself to be seen in these processes, I bow with submission to her decrees, and look upon it as the highest honour mortals are allowed, to become her interpreters. For an explanation of those laws I refer the reader to what I formerly advanced on the effects of heat, &c. (vide p. 103, Essay on Burns.) In this case Mr Earle has given me some certain data to form a judgment upon. The formation of a blister is with me a determined *point* to judge of the extent of the injury in that part. This accident

classes with those in which there is an increased action, but no destruction of the parts. Had the cutis itself been destroyed there would have been no blister ; the blister therefore demonstrates the extent of the accident ; and in this case, I can venture to assert, with the same conviction in my own mind, that *none* of the tremendous consequences pourtrayed by Mr Earle would have happened, as I can, that two and two make four. Whatever mode had been followed the child would have recovered ; and I believe if nothing had been done he would have been well as soon. I do not see the reason why the opening of the blister was so much dreaded : irritation on any part of the surface, so as to produce the action of the exhalents to throw out serum, appears to me to be nearly the same, whether it arise from cantharides, mustard, hot water, heated substances, &c. &c. Now we know it formerly was the custom in taking off a blister to take away the whole of the cuticle, and rub the bare cutis with a coarse towel. From this rough treatment no ill consequences arose ; a greater secretion of pus might be the effect, but I never heard of the deeper seated parts being in any danger from such irritation. With such views, and such experience, I hope my conclusions will not be deemed improper, should I even venture to say, that had the mode pointed out in my former essay been

been followed, he would have been well in half the time; in short, I might almost assert he would not have been ill: for had the part been well bathed with spirit of turpentine, covered with a thick plaster of digestive ointment softened with the same spirit, a poultice of bread and milk applied *hot* over the plaister, and a spoonful of white wine, with ten drops of Tinc. Opii been given, and the child put to bed, at the end of twenty-four hours there would have been no vestige of the accident.

Several cases are then related, in which ice produced, according to the statements, the most salutary effects: but lest I may be thought too minute in this discussion, I shall pass them over, and go on to the case of a poor woman, who, in a fit, fell into the fire. The injury extended over the whole of the neck, back, and breasts; in short, nearly half the body was scorched, and there was one continued burn, which made a surface by measurement, of more than four hundred inches. A considerable time had elapsed after the accident, before she was brought to the hospital, so that the heat of the fire had had scope enough to do great mischief; added to this, the *inflammatory* attack had been aggravated by the *injudicious* application of spirits of turpentine, so that her sufferings were extreme. The burnt parts were covered as soon as possible, with

with pounded ice, and ice water, from which she found immediate ease, and lived three weeks without complaining of much pain, and without that distressing fever which usually accompanies severe burns; after which *she sunk*, under the *profuseness* of the *discharge* from so large a surface, and expired. Mr Earle then adds, that it is impossible to say what a more early application of ice might not have effected; but in his opinion much greater advantage would have been attained, since in other instances, where it has been applied early, although the burn has been both extensive and deeply inflicted, a stop has been put to the heat and inflammation, and sloughs have been prevented from forming. But considering this case abstractedly, if ice could act with such effect as to keep this patient so long alive, and easy, what may not be *expected* from it in slighter burns?

The foregoing case induced Mr Earle to make the above observations; to which I must request the reader's permission to add a few remarks. Those parts of the case to which Mr Earle thinks his want of success was *chiefly* to be attributed, viz. the *application of spirit of turpentine*, and the *length of time* which elapsed before the using of the ice and ice water, appear to me to be the chief causes of the *success* he had in this case: for I must, knowing what I do, term it success to have brought the
parts

parts to a state of secretion, though it may be ranked with Mr Windham's negative success, as the patient was lost afterwards. I hope Mr Windham's *case* will not keep up the allegory. We are not informed concerning the mode of treatment after the process of suppuration commenced; but from the account, we have reason to conclude that the ice was continued during the whole three weeks of her existence, as we are never told of its being desisted from. Now I can easily suppose the theory of abstracting the redundant portion of heat from the system, during what is called the inflammatory *attack*, but I do not see the necessity of continuing the same means when the system is going through a various circle of actions, which require very different means to keep up the utmost of her powers in each. Those who wish to be informed why, and upon what principles, I suppose beneficial effects to have arisen from what Mr Earle imagines to have produced the contrary, I recommend to read my former essay, where they will meet with a full explanation. If, as in this case, I very much doubt of the advantages of the application of ice, I must also be allowed to doubt of its usefulness in cases of less magnitude; for I look at it *abstractedly*, and as I find it contrary to principle in one instance, I conclude it is the same in all.

There is one case more related in Mr Earle's
essay

essay which I cannot refrain from noticing ; not that the case itself requires much attention, but merely as it is announced to have happened under the immediate inspection of Sir Walter Farquhar ; on which account a degree of weight is attempted to be thrown into the scale, that may produce a false estimate, as the public are more easily induced to adopt an opinion countenanced by a popular physician, than from any real merit or truth the thing recommended may possess. Both those gentlemen (I mean Mr Earle and Sir W. Farquhar) enjoy much of the public opinion ; therefore their errors are of more consequence, as implicating a larger sphere. Besides, one of them has the care of the minister's person ; and should an accident of this kind happen to him, and he be treated according to Sir W. F.'s plan, from his habits of stimulation there could be no doubt of his destruction. England would thus lose her prime minister, and Europe, nay the civilised world might be endangered, and all be lost by this single mistake. On what slight incidents do the most momentous events depend ! Allowing this probability, the converse must be admitted, and I may have the supreme satisfaction of preserving the favour of Europe, and to my feeble efforts the civilised world may owe its remaining upon its axis. The case is as follows, related by the lady herself :—“ Early in the month

of

of March, 1792, one morning just after breakfast, I went into the parlour to speak to my mother, who was sitting by the fireside, so that I stood on the hearth with my back to the fire; and as soon as I had communicated what I had to say to her, and my sister, who was with her, I was going to quit the room, when the latter looking up, perceived that the back of my dress was on fire. Fright deprived her of all power to act, but my mother immediately endeavoured to extinguish the flames by wrapping her clothes round me, but in vain; the fire was become too strong; and as she concluded the carpet was nailed to the floor, she went out of the room to get something to throw over me; my first impulse was that of following her, when, providentially, I had the presence of mind to see that such a step must prove fatal; and throwing myself down on the carpet, I rolled over and over, begging my sister would try and cover me with it; which she could not do, being deprived of strength by her fear; my mother soon returned with a large mat; and the servants, who had been alarmed by my screams, came in at the same instant to my assistance; they threw the mat over me, and themselves upon it, in order to smother the fire; and after some little time succeeded; but not before I was severely burnt in two places in the small of my back, the back of my neck, and
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the under parts of both arms, just above the elbows. I had burnt the fingers of my right hand in attempting to untie my muslin sash. My mother's hands also suffered; as, on raising me from the floor, some fire blazed from the back of my handkerchief and cape of my gown, which she stroked down from my head, and pressed out with her hands. When I had a little recovered from the shock, I sent off directly to request the favour of Mr Farquhar, (now Sir Walter Farquhar, M. D.) if at home, to come to me immediately; if not, that he might be informed of the accident as soon as he returned, and that I was impatient to see him; three or four hours having elapsed, I sent again to Mr F. and as he was not come home, one of the gentlemen from his house very obligingly came to me; yet I *declined* availing myself of his advice, being *determined* to wait till Mr Farquhar could come to me, owing to the anxious wish I had of having his opinion and advice in preference to all others. In the mean time I had applied scraped potatoes to my hand, and some oil to the rest of the burns. About ten o'clock in the evening Mr Farquhar arrived; and after he had seen the places which were burnt, he ordered some ice to be sent for instantly, and that I should have somebody to sit up with me all night, who was to keep constantly applying to the burns cloths *dipped* in the ice, and

and to be changed as soon as the chill went off; that if I became weary, and could sleep, they should get some fresh hog's lard, and first wash it extremely well with water; after which it was to be beat up with ice spread on linen, and laid on the burns; but as soon as I waked, to use the ice simply as before. When Mr F. left me, I had my bed immediately laid on the floor, as being more easy and convenient to those who attended me, and strictly followed Mr Farquhar's directions the whole night. On first applying the ice, it made me *shudder* for a minute or two; but the *pain* I felt was soon abated, and in the course of the night I got a little sleep. At noon next day, when Mr Farquhar came, he found me in a fair way of doing well, and only requested I would persevere in applying the ice frequently, and in the intervals keep the hog's lard and ice to the burns. I soon experienced the benefit of this method of treatment, for in a few days the fire was entirely *drawn* out, and though *all* the *blisters* had *broke*, *not one* of them had the least tendency to become a *sore*. [*This would appear to contradict the terrible consequences that Mr Earle predicted, should the blister have broke spontaneously in the case of his son's hand.*] Considering how much I was burnt, the pain I suffered was comparatively trifling. [*From what could this lady judge? It does not appear she had ever been burnt before, or seen others*

others who had.] which I am *persuaded*, was entirely owing to the application of the ice; and my mother, who also used the ice to her hands, was cured in a few days. In the course of a *month* or *five weeks* I perfectly recovered, and have never since suffered the smallest inconvenience from that accident; nor did I at the time catch any cold, though I sat up for the most part of the first night, with scarce any cloathing, and as the ice dissolved, of course I was very wet; [*This account does not speak much for the comfort of this practice to the individual's feelings.*] and although I had before this accident, been for more than two years greatly indisposed by *nervous* complaints, I had not any fit, or those nervous symptoms which my friends were apprehensive would have been the case, after the terror and fright I suffered by the accident."

The whole of Mr Earle's essay seems more intended to recommend Sir Walter Farquhar's practice of applying ice in burns than any thing new of his own. This being the case, I am surprised Sir W. F. should have let slip such an opportunity as this of giving his own ideas on the above case, which most probably was drawn up at his instance. I have no doubt of the accuracy of the lady's relation; and had it been written as an interesting scene in a novel, it would have had great merit: the fright of the mother and sister, the alarm of the whole

whole family, the young lady's presence of mind, are all pourtrayed with a degree of interest that does credit to her descriptive powers; and her stoicism in refusing relief from any but the hands of the happy Sir Walter, finishes the climax. Except in this instance of the power of imagination, the whole case does not furnish a single idea to the medical reader.

We see something of the same kind of mental operation in instances related in Perkins's account of the metallic tractors. There are several accounts of scalds and burns being cured by the use of such means; among the rest I shall notice one: "Your tractors, which I lately purchased to use in my family, I have applied with great success, upon a person *scalded* with boiling lie. A man by the name of Welch, who was at work in my potashery, when boiling down the lie, some of it flew into one of his eyes, which soon became very much inflamed, and swelled to such a degree that he could not open it, and remained in that situation for the space of three days. After the tractors had been used a few minutes, he was able to open it; and with two applications only, his eye was entirely free from pain and inflammation, and in a short time was perfectly well, although so badly scalded that he had despaired of its ever recovering." [James Glover, Esq. county of Troja, state of

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New-York;

New-York; see the influence of metallic tractors, &c. by B. D. Perkins, A. M. page 67.] Having noticed this case, lest my readers should suppose it claims any merit as a medical application, I recommend them to read Dr Haygarth on the imagination, where the powers of the tractors are justly appretiated: * it is a curious subject, and will repay them for their trouble. They will there see the tractors treated as animal magnetism was upon the continent.

Dr Perkins's harvest upon John Bull's credulity has been a pretty good one, though not equal to his predecessor, Mons. Mesmer's. That to act strongly upon the imagination by the stimulus of hope or expectation is capable of drawing off the mind from its attention to certain degrees of bodily pain, is a fact that must frequently have fallen under the cognizance of the medical observer, and to a certain degree ought to be calculated upon; we should only guard ourselves and the public against that *dupism* which is too commonly practised by the bold and impudent quacks of the present age,

* He used pieces of wood shaped and painted like the tractors, which produced effects equal to the metallic ones. Dr Perkins now attempts to *amuse* the public by the effects produced upon animals. It ought to be noticed that this is changing the object upon which they operate, for here the spectator is acted upon instead of the patient, and nature works the cure.

age, not in *physic* only, but in all other professions and concerns in life. The histories of Magnetism and Perkinism serve to shew us how powerfully the body is acted upon by moral causes, and ought constantly to be held in view by medical philosophers, whose task in drawing conclusions from the phænomena which may be presented to them, is of the utmost import, as the lives of thousands may be implicated by a single error. Requesting a lady to write her own case, and give her opinion upon the methods which relieved her and her mother, may produce an effect on that part of the public who are not better able to form an opinion than the lady herself. Who can doubt of the number of attested cures both by Magnetism and by Perkinism? The patients believe; the spectators believe: even when both of them class in the learned professions! Nay there are even medical men so weak as to believe; and the truth is only apparent to the steady eye of the enlightened naturalist. He is accustomed to the task of observing; and by a glance of his tutored organ, acquires a knowledge of facts which are invisible to the common observer. All appeal to facts, and to their own experience; but some forget, that they are not in a state to judge of facts or experiments. As well might the drunken man say that every thing is double because it appears so to his eyes,

or the imbecile, who sees visions, and converses with airy nothing, affirm that they are true effects. I ought to beg pardon of the reader for being so diffuse in noticing this as well as the other cases; but as they imply conclusions which I cannot admit, and teach principles which I believe to be erroneous, I think it my duty to offer such remarks upon the nature of this evidence as may lead my readers, on a comparison of the facts I shall hereafter bring forward, duly to appreciate the value of the two modes of practice.

From the whole of what Mr Earle and Sir W. Farquhar advance, it appears that they consider fire as a body which enters, or rather unites with part of the system, and which they suppose is drawn out by any body, which, having a smaller proportion of caloric, is capable of receiving most quickly the surplus of heat in the part affected. Mr E. says, “from every observation I have made, the fire does not produce all its effects on the first attack, or immediate contact with the part; but afterwards lies *rankling* in it, and continues to spread its destructive influence until its *fury* is spent, or its power counteracted, as is evident from the continuance and even increase of the excessive pain and inflammation.” Again—“Whether modern philosophers will allow that fire applied to any part of the human body does remain united to it for a time,

time, I am not certain ; but such appears to me to be the fact, and this opinion, I find, has been maintained by several very respectable authors."

As to the opinions maintained by either ancient or modern authors, we must wave all except those who give us facts ; for the human mind is the same at present as it has been for thousands of years past ; and if we follow either the one or the other into the regions of fancy, we may spend years in repeating idle visions, or in forming new ones. But as I should deem this an abuse of time (the most precious gift enjoyed by man) I must be excused from entering upon the task.

I have in my former essay mentioned at some length the effects of different degrees of temperature upon the animal system. It will there appear that animals endowed with the property of life, have a power of preserving their existence under a varied degree of temperature proportioned to the perfection of their organization, and if gradually applied, the extent of the scale is greater. Man will exist from zero to two hundred and sixty degrees of Fahrenheit's thermometer ; though rapid changes much within that range will destroy him. Such is his glassy essence, that it appears necessary to treat him as artists do that substance, viz. to anneal him, by allowing his temperature to be changed gradually. Such is in some delicate con-

stitutions the narrow scale of accommodating power in the system, that a change which appears insensible to persons of a more healthy frame, produces such disturbance in the actions of absorption and secretion, as to bring on complaints of the most serious nature. Delicate ladies who keep close within the house, in going from one room to another bring on that state of the system known by the term of *catching cold*. This state is also very frequently induced by a too sudden and great application of the stimulus of heat, after the torpor induced from lowering the temperature only a few degrees. The effect of a diminished quantity of heat is proved by the facts adduced by Mr Hunter, of the rabbits' ears, (*vide First Essay, p. 108.*) to have stopped all action in the part; and the effect of increased heat applied to my own body (*ibid, p. 111.*) proves the increased action induced by heat. I do not mean by this to deny the power of fire combining with, and decomposing any part of the system to which it has been so applied. I am well convinced I could burn my finger off over an Argand's lamp; but after this decomposition, I should not expect that ice would draw out the caloric, and restore me my finger. When caloric combines with any substance, a chemical union takes place; and when this is done with the living animal fibre, it is at the expence of a destruction

struction of organization, which no human art can restore in that individual fibre. Yet supposing a finger, or part of a finger, to be so destroyed, there must have been increased action previously to destruction ; and where destruction ceases, increased action, from this greatest of all known stimuli, will begin. Now as I think it will be granted that parts cannot be restored, those which we have to take care of must class under the head of parts with increased action. If this be admitted, I believe I have formerly pointed out the best *known* modes of treatment. What to me is one of the most convincing proofs of the truth of the principles I wish to be made known, is, that the *inverse* of them is proved to be true by the experience of all countries subject to a diminished temperature ; and, reasoning upon the same data, Mr Earle's principle must be erroneous : for instance, if in a *plus* of heat it should be drawn off by cold, in a *minus* of heat, it should be added by the body which is the readiest to part with its heat. The following case will illustrate these principles :—In the beginning of this year (1800) there was a severe storm, in which many ships were lost upon the coast of Northumberland, and a great number of men perished from the intensity of the cold. Three were taken to a small inn in a fishing town on the coast, and as one was very much *frost-bitten*, with the best intentions

in the world the good people of the inn prepared a hot bath for him, in which having kept him a sufficient time, they put him to bed, and gave him some hot ale and brandy. The consequence of this treatment was, that the torpid actions of the system were so rapidly put into motion, that the vital power was exhausted in forty-eight hours, and the man died. The others, who fortunately had not so much *false* care bestowed upon them, recovered with difficulty; for although they did not use the bath, they had a share of the other stimuli applied, sufficient to produce pernicious effects. Now had Mr Earle's principle been right, the man would have lived, as they took the readiest way of applying, both externally and internally, the *deficient heat*. Had the opposite practice been taken with this man, I have very little doubt but he would have recovered: the frost-bitten parts (the extremities, both superior and inferior) should have been thawed in water not above 40 degrees; he should then have been put into a cold bed in a room without a fire; and if he had been allowed any stimulating drink (such as ale) it at least should have been cold: but of the propriety of allowing, at an *early* period, even this stimulus, of *cold fermented* liquor, I have my doubts. For the danger of allowing too great stimulus after what is termed an accumulation of irritability, I refer the reader

to

to accounts of ship-wrecked people : the narrative of the loss of the *Bounty* will supply them with sufficient observations on this head. (See Medical Extracts.) As the powers of life returned to their usual healthy action, a greater proportion of stimulus might have been indulged in without danger ; and thus would the *unity of action* have been restored between the parts and the *whole*, upon which the cure depends in both instances, i. e. whether a part is thrown into excessive action from the sudden application of heat, or becomes torpid from the sudden diminution of heat.

Having now at some length reviewed Mr Earle's pamphlet, and combated the principle upon which it is founded, I shall wave any comment upon the insufficiency of the detail, which is certainly great ; and shall proceed to relate some cases which may still further demonstrate its fallacy, and establish the opposite principle, upon such a basis, as not to leave a single doubt in the minds of impartial medical men.

Some of the following cases have happened under my own eye ; and others are related by gentlemen of whom I have no knowledge, and over whom I certainly can have exercised no influence. Their unbiassed testimonies therefore, will add considerably to the importance of the evidence, particularly with that class of readers, who judge merely from consequences. To the admirers of principle

ciple in medicine as well as in other sciences, it must give infinite pleasure to see that the beautiful movements of the animal œconomy, which medical philosophers in their closets have supposed to exist, are here displayed, and proved by careful attention to phænomena that appear during the different stages of dangerous actions in the system; and that by different treatment during those stages, the individual may be restored to health, or the living power exhausted to death.

The following case, which was communicated to me long before the publication of Mr Earle's book, bears so strongly on the point in question, that I have much pleasure in laying it before the public. We have here from accident, what the most candid practitioner would have wished from design, had a comparison been desired of the efficacy of the different modes. Mr Anderson, of Newcastle upon Tyne, surgeon, a gentleman who has practised for above twenty years with that respect which a liberal education ensures, writes as follows:—

“ SIR,—My practice in collieries has not yet afforded me an opportunity of adopting your plan of applying stimulants, in any desperate cases of burns; but in the slighter, or superficial cases of burns, I have found them act like a charm. I am informed that the practice of immersing the part in
cold

cold water for the space of twelve or fourteen hours after the accident, is in general use in Edinburgh. As both the Ol. Terebinth. and cold water were used at the same time, but on different parts, in the case of Mrs. K. (which I formerly named to you) I shall give you some particulars of the case.

I am, Sir,

Your obedient Servant,

*Bigg-Market, }
Sept. 8th, 1798. }*

JOHN ANDERSON.

CASE.

A lady, in endeavouring to remove a pan from the fire which contained boiling fat, had the misfortune to receive some of it on her right arm and face : I saw her a few minutes after the accident, about nine o'clock in the morning ; she was sitting on the floor, and her arm was immersed in a pail of cold water ; her face was flushed and appeared much scalded, and she complained of great heat and pain. I immediately applied the Ol. Terebinth. to it, and continued it for a few minutes. She said that her arm was so much relieved by the water, and that it had succeeded so well in a former accident, that she wished to continue it for a few hours. I saw her about four o'clock in the afternoon, her face looked much better, and was easy. She had continued the immersion, *often* changing

changing the water ; but when her arm was taken out, though only a minute, she complained much of the pain ; *indeed* it appeared that the inflammation was increased. I recommended an emollient poultice, after she should be tired of the cold water. In the morning I called again, and was informed that the pain of her arm had been great during the night. The inflammation had extended above the elbow, several large vesications had been opened, and deep sloughs formed on her hand and arm. I applied a digestive ointment to these parts, and a large warm poultice over the whole. The face was perfectly easy, and had no vesications, but the cuticle was a little abraded. I scarcely need add that the arm required dressing daily for a fortnight after the accident."

Such is the report which was given to me, and has been in my possession since the date of Mr Anderson's letter. The facts are so clearly stated, and the conclusion is so obvious, that it appears almost unnecessary to make any remarks upon the case. We perceive the lady's predilection for cold applications, and her appeal to former experience : nay it is even possible that, had this lady's arm only been injured, and a less judicious gentleman of the faculty employed, the apparent ease, from the sudden *stopping* of the increased action, and her getting well in a fortnight from the effects of such

a dreadful burn, when, from the history of some cases, it has required six or twelve months, or even longer, we might have seen this case brought prominently forward in favor of Mr Earle's practice. Such is the difficulty in forming an opinion of medical effects from even what is so apparent to the senses. The different effects produced upon a different part of the body similarly affected, have impressed a conviction on the mind, both of the lady and the practitioner, that nothing will ever efface. With those who have confidence in medical history, the above will have some weight: to those who have any doubts, I should wish such an opportunity to happen: This case I hope will plead my apology for what I have asserted in respect to that of Mr Earle's little boy.

There is one observation to be made on this case, which is unconnected with the particular treatment, but relates to the practice of medicine at large. It is much the *fashion* to yield to the particular feelings of patients in many diseases; and as it is sometimes attended with a good effect, it has with many practitioners become a kind of rule to invite their patients to study and express these cravings: but as I have seen this state of mind often troublesome, both to the patient and friends, I think it should not be wantonly encouraged. If a very urgent desire arise, and neither my own experi-

ence

ence, nor the marked experience of others, militate against its use, I certainly should yield to this impulse, and would carefully watch the experiment : but, as I find in the case of burns, many are the dupes of their feelings, in running to an opposite extreme, I should think it my duty to prevent them from pursuing every fallacious indication. This is a part of practical medicine, which has not been much cultivated, at least not accurately. The present system of periodical journals would, better than any other means, enable the practitioners of this island to form a collection of the good and bad effects of indulging the spontaneous cravings of the system in different states of disease.

As the authors of the Medical and Chirurgical Review (vol. 4th, p. 432, and following) in noticing my essay, affect to suppose that I am more governed by theory than practice in my dislike to cold applications, I must relate to them the following case which happened under my own immediate inspection to a medical gentleman, my assistant, Mr Bell (the same who has made the communications upon burns in the Medical and Physical Journal) a young gentleman whose extensive knowledge of the living and dead languages, joined to a great turn for medical discrimination, leaves me little room to doubt but that the republic of medicine will owe much to his labors. He had

had the back of his hand severely scalded by steam between nine and ten o'clock in the morning, in the summer of the year 1792. This was previous to my intention of publishing, and when I was undetermined myself as to the most effectual mode of relieving such accidents. It would appear he was partial to the cold applications (no doubt from some preconceived theory), for immediately after the accident it was plunged into a jar full of *Aquæ Lithargy. Acetat. Comp.* which was renewed as often as it became warm. This was continued during the whole day: at night it being painful when taken out of the cold liquid, folded rags wetted with the mineral water were applied at bed-time, and thirty drops of *Tinct. Opii* taken. Notwithstanding these means, it interrupted the night's repose, and frequently required fresh applications of the wetted rags. On the following morning it was blistered, and pretty easy, until he had occasion to ride a few miles into the country, when the pain returned, though not with so much vehemence as at first. On his return he again resorted to the jar of cold liquid, and in about two hours he was free from pain. Nothing further remarkable happened during the cure; the cuticle peeled off, and a week's dressing completed the business. The reviewers observe, "We cannot help suspecting, that the author's objections

to the use of cold applications are more the consequence of a previous theory, than founded in accurate observation of their full effects. The use of cold water in burns seems to us to be established on the surest foundation of *facts*; although it must be allowed that there are cases in which, from the great extent of the injury, as well as from *other causes*, it may be inapplicable, and therefore it may be desirable to have other remedies, to which we can occasionally recur." If these gentlemen will look at the above case, they will see my opinions were not drawn from mere theory in respect of cold applications: besides, I have in more extensive burns, viz. in collieries, tried the effects of the aqua vegeto mineralis applied cold with rags wetted, which has always momentarily been attended with that deception of sense, viz. producing ease, though it has *ever* been followed, in my sphere of experience, by a greater subsequent degree of pain. They then quote my opinion, "that the action induced by the excess of caloric is paralysed by the application of cold; which in this mode of treatment must be continued until the vital principle of the part so excited is destroyed, otherwise the pain returns with redoubled violence, so that this ought to be called the *killing cure*; for any thing short of this would be ineffectual." "This statement," they say, "is certainly inaccurate.

inaccurate. We can aver, from personal experience, what indeed has been observed by many others, that in burns of no inconsiderable extent, the application of cold water removes the pain almost instantaneously, which yet is *ready to recur* if the cold is discontinued; by perseverance, however, for half an hour, or more, [*This certainly must be a mistake, as we find an application of cold for twelve or fourteen hours is not adequate permanently to remove the pain.*] the action of the parts, productive of such acute sensation, at length ceases to return, and the part is left in a sound state, *except* that the superficial vessels continue for some time to carry a larger portion of red blood.”—

On reconsidering this matter, (for I have no object in view but to assist the practitioner in relieving his patient) I cannot hesitate to own that I may have pushed the argument too far when I called it the *killing cure*; for in the cases alluded to by the reviewers, the quiescent process seems only to have gone to the extent of palsy; and the vessels which were gorged with red blood seem to have taken on the ordinary actions at some time distant from the accident: but this mode of cure can only be attempted in burns of certain extent, to persons of a certain state of health, and by an adequate length of time for the application: for though it may in some cases not be necessary to

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check action to death, yet if the parts are not rendered perfectly quiescent, the pain returns with increased violence, as we see in the case related by Mr Anderson; and even in Mr Bell's case, after the part was quite easy the following morning, yet by exciting the system the palsied part again took on the action with diseased sensation, and was again obliged to be rendered torpid by the renewed application of cold, for two hours. The cases above-mentioned, I trust, will dispel these gentlemen's doubts, in respect to the different powers of the two modes; and I hope to strengthen their opinion of the use of stimulants by adducing further proofs of their efficacy.

Having assented to this reproof of the medical reviewers, I shall now notice wherein I dissent from them, lest silence on my part should add strength to what I deem error on theirs. They say, "even admitting the author's theory, that the cure depends on inducing a unity of action between the injured part and the system, the local application of cold may be defended; for the power of cold in lessening action is admitted, and by this means the excessive action of the part may be reduced to its proper level."—What is here meant by cold? I have wished to avoid the confusion arising from indefinite terms. If they mean by cold, the application of water at 40 deg. to a surface injured by

by water heated to 212 deg. which I suppose they do, I affirm it is not compatible with my theory, nor with my practice. To apply water at 200 deg. in such a case is 12 degrees of cold; but such is the state of our language, that if we do this we say that heat, or a violent stimulating application is used; yet it is evident that it is not a stimulus in comparison with that which caused the injury, but is applied to prevent the *too sudden* diminution of the violent action caused by the injuring stimulus: now the application of cold water in the common acceptation of the term, causes the very *injury itself* which the whole of my practice tends to obviate.

I hope I shall not be supposed to entertain any doubts of the authenticity of what either Mr Earle, or the reviewers assert: on the contrary I suppose the truth of all their assertions; and from such premises as I bring in parallel, I trust I may be allowed to form my own conclusions, although they have a directly opposite tendency. In confessing I have urged the point too far in calling the cure by cold the killing cure, I beg leave to retract that term, and in its place call it the cure by *paralysis*. I have lately been informed by a gentleman who has been studying at Edinburgh, that the cold treatment is in general use there. He mentioned the case of a lady who had been scalded in her foot, and had kept it immersed in water, frequently

quently renewed, for three days, and the two intervening nights. Even admitting the power of cold to cure burns by such a continued application, it could only with safety be allowed to very limited injuries ; for in cases which frequently occur in collieries, of men engulfed in liquid fire, nothing short of a cold bath could apply to the whole of the injured surface, and such an application, for such a length of time, I apprehend would bring on the grand paralysis—DEATH.

This practice of applying cold water is not new. In the Memoirs of the London Medical Society, volume 1st, page 315, there is a paper which was read to the society on the 18th April, 1780, by Stephen Lowdell, surgeon, F. M. S. where cold applications are recommended in cases of burns ; he says, “ A lady’s head dress having took fire, his hand was much burnt in extinguishing it. Finding his pain much relieved by applying cold oil, he immersed his hand into a large pot of oil, and the interval of ease became longer. He afterwards used a poultice of oatmeal, extract of lead, and oil on going to bed, and waked next morning free from complaint, except that two small blisters remained which afterwards gave him no trouble.”

This case is one of those slight accidents which would have done well by any treatment, therefore no conclusions ought to be drawn from it either for or against the means used.

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In the 5th volume of the same memoirs, page 62, there are some cases related by Thomas Parkinson, surgeon, Leicester, read in Feb. 1795, in which cold produced by the evaporation of spirit of wine, is recommended. He expresses his disappointment in the usual mode of applying cold, and points out the superiority of this.

Case 1.—A young woman had her face, neck, shoulder, and part of the abdomen scalded by hot water. The usual *oily* applications had been used for two hours previous to the author's visit. During twenty-four hours a pint of spirit of wine was consumed in moistening the affected parts, which were first covered with bladder. "Whenever the operator desisted for a little, pain recurred with severity, but ceased upon reapplication of the means. The excoriated parts, which were much less than might have been expected, were dressed with common white cerate, under which they speedily healed."

Case 2.—By the explosion of some gunpowder, a young man, a blacksmith, was terribly burnt; having his coat off his shirt took fire, and increased the severity of the accident. The parts injured were first washed with warm milk and water; rags spread with cerate were next applied, and on the outside of this application spirit of wine was unremittingly used for twenty-four hours. This produced ease, with considerable abatement of inflammation.

flamation. This plan was pursued till the evening of the third day. Two quarts of spirit of wine were consumed; the deep floughs were dressed with soft digestive; a cooling purge was given; and wax and oil completed the cure. No deformity of consequence remained. Some more cases of smaller import are added.

Mr P's confession of his disappointment in the common mode of applying cold by saturnine applications, &c. induces me to think he has mistaken in drawing his conclusions of the effects of alcohol. I rather suppose the stimulant effect of that application would have a considerable share in producing the good consequences Mr P. relates, notwithstanding the care taken to prevent its entire good effects by intervening media. Several cases of the supposed benefit from cold may be seen in my first essay, page 44, in a memoir from *La Medicine Eclairée*.

CHAP. III.

Further Observations on the Treatment of Burns, as recommended according to principles laid down in the former Essay—Case, G. Clark—Case, Tho. Pyle—Case from an Explosion of Gunpowder—The Treatment recommended to the Attention of military and naval Surgeons—Letter from Mr S. Hamnick, Surgeon, Royal Naval Hospital, Plymouth—Letter from Mr Horn, Surgeon to the Newcastle Infirmary—Letter from Mr Fife, Surgeon, Newcastle—Letter from Mr Bell, of Chester-le-Street—Case by Mr Bell, Surgeon of H. M. S. Pelican—Mr Westgarth's Observations.

HAVING reviewed the opinions of the faculty on the opposite side of the question, it will naturally be expected that I should bring forward some proof in confirmation of the practice I seem so anxious to establish. I wish *nearly* to confine my own relation of practice to those tremendous cases which would inevitably terminate in life or death, according to the mode of treatment the practitioner should be induced to follow, *except* perhaps a *few* others, which some particular circumstances have rendered interesting, as tending to illustrate what has appeared to me obscure; likewise to shew its utility

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in cases of accidents happening from gunpowder, in which, from the present situation of the European world, there may be an extensive field of practice. I am not so little acquainted with the human mind as to expect to overturn the former opinions of *all* old practitioners on this subject. The history of our art, as well as that of all sciences, shews us the tenacity with which opinions are held. If men could resist the evidence of the circulation of the blood, and even enter into combinations to prevent the belief of such a *damnable heresy*, the doubting of which at this day would be looked upon as an egregious folly, how can I expect to be more successful? Upon the whole I have met with *much* more professional candor than I expected; I have even seen habits of forty years bend to the influence of my arguments, and confess the superiority of my mode; but on the other hand I have seen it resisted; and when the light was the clearest, instead of seeing they have shut their eyes. To attempt to convince such men, would be equally as absurd as to carry a torch to light a blind man.

About two years ago I had an opportunity of pointing out to the pupils of a public institution, the superiority of this practice in a very striking manner. A child was brought for relief, who had been burnt by its cloaths taking fire. The neck,

breast, face, hands, and arms were very much injured. It was ordered to have the Ol. Lini c. Aq. Calcis applied to it, and afterwards to be covered with plasters spread with ceratum flavum; and when the paroxysms of pain recurred, to be again bathed with the liniment, as was formerly the practice. It was allowed a small anodyne at night, but otherwise the practice was anti-phlogistic. The pain continued at intervals for several days; the parts did not suppurate; but on the the third and fourth day tumified, as did the contiguous cellular membrane. A fever, with thirst, great restlessness, and on the seventh and eighth day a considerable coma occurred; and on the ninth day the scene closed with the death of the patient. Nearly at the same time a similar accident was received, which was treated according to the principles of my essay, both by external and internal stimulants. The stages of the complaint were so strongly and favourably marked, and the child recovered so quickly, and perfectly without any scar, that the gentlemen who saw these two cases, assured me they were well convinced of its superiority, and I have no doubt it will always influence their future practice.

On a former occasion, I contented myself with dividing this class of accidents into two species; since which I have not found it necessary to deviate from

from that arrangement: each species should be again divided into two stages; and to distinguish them, the first may be termed the *stimulant*, the other the *equalising* stage; though in fact the first stage is not meant to stimulate, if by that term an *increased* action is meant, but only to prevent that dangerous torpor which would take place, if the violent action was too suddenly allowed to cease. The former principle of treatment in these two stages I still retain, though in the detail of practice I have been induced to make some alterations, the advantages of which have to me been very apparent. The result I shall relate for the guidance of those who may be induced to follow the practice. In the first species, *where the action of a part only is increased*, I have not found any thing better for the first application than the *beated* Ol. Terebinth. and the digestive thinned with the same. In superficial burns, when the *pain* has ceased, it will be adviseable to desist from this application in about four and twenty hours, as that time in many cases will be sufficient, and at the second dressing a digestive sufficiently thinned with common oil, will be adequate to the case; and on the third day to begin with the ceratum e lapide calaminari. I have frequently seen secondary inflammation excited by the remedy, which in the first instance puzzled and perplexed me considerably: I have
likewise.

likewise been informed of this consequence by several gentlemen. The most certain *remedy* for this unpleasant symptom is to apply a plaster with digestive thinned with oil, or a plaster of cerate, and over that *a large warm* poultice. This most effectually takes off the irritation of the part, and the cerate will finish the cure. Should there be much uneasiness of the system, an anodyne proportioned to the age of the patient should be given. And it may here be remarked that large anodynes in such cases ought to be used, as they always produce the happiest effects ; and I have never seen any ill consequences from them, though given to a much greater extent than I have ever dared in any other circumstances, (except in some cases of Tetanus, where no good arose from their use.) I am sorry to remark in the greater number of cases I have been favoured with, that the gentlemen have not benefited so much as they ought to have done in exciting the stomach by the strongest and quickest means we are acquainted with. Of the use of counter-irritation in suspending some diseased actions, the history of medicine affords too many proofs to leave a doubt in the mind of any medical philosopher ; but on whatever principle or law we explain it, the fact is undeniable ; and though the external mode of itself may in most instances be equal to give greater relief than the old methods,

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yet finding the most striking benefits in desperate cases to arise from such means (for in some instances life itself would be forfeited without them) I cannot too strongly recommend a *degree* of the same practice, though in less urgent circumstances. I do not mean by the above observation to infer that a counter-irritation is the only benefit arising from such a measure—no!—I also believe that as the irritation on the surface has increased the action of that part, and as that part sympathises in a series of actions with other surfaces of which the stomach is as it were a centre, the irritating that viscus increases its actions, as also those of all sympathising parts, of which the skin is one; so that this *magic circle* of actions, constituting what is termed HEALTH, is thus broken in upon, in as *small* a degree as possible, consistently with the violence that was first offered to it.

In the second species, or in those cases *where some parts have increased action, and other parts are destroyed*, for reasons already assigned, it will only be necessary to pay attention to the living parts: and as those parts will come under the denomination of parts having increased action, the same means must be used as in injuries of that species. The internal treatment should be more strictly attended to in these cases, as in considerable accidents, where large eschars are formed, the system has several different processes

processes to go through before it is again rendered perfect. In each of those states it may be considerably assisted by art. The immediate increased action on the surface is to be kept up by a high temperature; and the equilibrium of the exhalent and absorbent system should be continued by exciting artificially, by every means in our power (spirit of turpentine is the most effectual I have yet found) the absorbent vessels of the injured part, to equal the increased action of the corresponding secreting system. When parts of the surface are destroyed, and eschars formed, we must judge of our treatment of those by the appearance of the parts *less injured*; for as soon as secretion takes place on the least injured parts, we may rest assured that the stimulant plan has produced its beneficial effects; for the separating of the eschars is a process of the system, to assist which is our duty; but we must here make a distinction between assisting and hurrying. I have formerly fallen into this error myself, and have rendered the sores extremely irritable by too great an anxiety to urge them to throw off the sloughs. I am now less anxious in that respect, finding the less injured parts a just criterion for the mode of treatment to the others. When stimulants are indicated to be desisted from by the appearance of the one, I desist from them in the other; always finding the system adequate to complete

plete her work. If it require more time, it produces less distress, and in the *end* facilitates the cure, as the ulcers afterwards heal much more readily, being less *irritable*.

In my former essay I was considerably at a loss in recommending an adequate power to repress the growth of fungus, and to absorb the redundant secretion. In the case E. F. (page 93, former Essay) which was more than a year under the treatment to the cure, various astringent and absorbent means were used, all of which were inadequate to produce a permanent good effect, and required frequent changes to complete the formation of tender and unseemly cicatrices. In the appendix I mentioned chalk as recommended by Mr Cleghorn. In my first trials upon ulcers I did not find this answer my expectations, as I thought it irritated the surface and increased the secretion of pus; but having since had it prepared under my own eye, as directed in Lewis's Dispensatory, and afterwards finely levigated, I am induced, from considerable experience, to *change* my opinion with respect to its powers; and here I freely offer the tribute of thanks due to Mr Cleghorn for recommending it. As soon as secretion takes place, I begin the use of powdered chalk, heated to the temperature of the body, which is plentifully applied to the whole secreting surface, and afterwards
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covered with a plaster spread with cerate. In cases of eschars coming away, or while they are detaching themselves, I fill up the hollow made by their loss when separated, and fill up the furrow at their edges when loosening, with powdered chalk, covered with the plaster; and if the process be tedious, a poultice of bread and milk is applied over the plaster. In very severe and extensive accidents of this kind, I have used this method throughout the whole cure after the formation of pus, and have in *general* found it prevent the necessity of either astringent or caustic applications: nor on the other hand have I found it retard the cure, by repressing the necessary secretion. Mr Home, in his Treatise on Ulcers, recommends powdered bark, and rhubarb; and various other substances have been tried by others, but as such good effects arise from this, may we not suppose that the benefits derived from many of these articles arise in a great measure from their being inirritating absorbing substances? I am the more inclined to this conclusion by finding chalk produce exactly the same effects when united with flour or starch powder. Mr H. likewise mentions chalk, but does not appear to be acquainted with its powers.

I hinted in my appendix an intention of trying the carbonic acid gas as a means of cure. In some ulcers I have tried it; but from the complicated
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apparatus, and the difficulty of applying it, I was inclined to desist : for should even *supposed* good effects have accrued from its use, until a more advanced state of knowledge in the management of elastic fluids, it could not be generally adopted. The many advantages arising from the use of chalk are such as have induced me to remain content with it ; and upon the whole I cannot too strongly recommend its use. Should these hints induce others to make rational experiments of other substances from these known principles, I should be happy to hear of them, and to benefit by them in my practice. These are the principal alterations I have made in the external mode.

I cannot attribute the success I have met with wholly to the application of external means ; the treatment of the general system bears a very great share in my opinion ; and that treatment is as extraordinary, and as contradictory to the old methods, as any other part of the practice. In my former essay, in the reflections upon the case of E. F. (page 98, 99.) I mentioned a *full diet* as allowed with the stimulant method of cure, which I supposed to have kept up the irritation of the system, and caused the immense continued discharge by the exposed surfaces of the wounds, which became like old ulcers ; and the system was so distressed as to take on the action of hectic, which it retained in

a degree for some time after the cure. A case which I shall afterwards relate (of George Clark) confirmed what I before from *theory* conjectured : on the *ninth* day a *counter-irritation* took place, by means of a violent diarrhœa ; the diseased action of the intestines, and the irritation of the sphincter ani, suspended the too great secretion of the sores, and the surface became almost quite *dry*. Between this and its again secreting plentifully, there was a *point* or an *equilibrium* of action, at which the skinning process was more rapid than I ever before beheld it in any subject. This accidental explanation of my preconceived theory, induced me to profit by it in subsequent cases. I have with marked good effect produced an artificial counter-irritation with cathartics, and brought on a state in the secreting surface which has very materially facilitated the process of *skinning*—a process over which art has, as yet, acquired very little influence. In the intervals of the use of cathartics, the diet was bland and nutritive, such as bread and milk night and morning, boiled meat with potatoes for dinner, and no fermented liquor.

CASE.

October the 30th, 1798, George Clark, a workman in one of the mines upon the river Tyne, a
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young and vigorous man of five and twenty, from a quantity of inflammable air taking fire in the mine, was immerfed for a confiderable time in the flame of the burning air. He had neglected to put on drawers, which miners in general wear, and ought *always* to wear, and had on only a flannel shirt with sleeves, which had large holes in different parts of the arms. The shirt collar was open, and expofed the breaft. In looking at the ftate of the individual we fhall fee how he was protected from the flame: his legs, thighs, pofteriors, and privates were all burnt; as were his hands, large fpoths upon the arms through the holes in the shirt sleeves, his neck, breaft, and face. Immediately upon the flame ceafing to act upon him, he had a fevere fhivering fit, which lafted fome time, and alternated with a violent fenfe of burning, from what I could learn, nearly every half hour, until he was vifited, which was full three hours after the accident, which happened about eight o'clock in the morning. A draught, with fixty drops of laudanum and two drachms of æther, was given to him about eleven o'clock; and he was profufely bathed with heated fpirit of turpentine for fome time, over which were applied plafters thickly fpread with digeftive, rendered to the confiftence of a thick liniment with the fame fpirit. He had a volatile cardiac julep to take a dofe of every three hours; the

the anodyne was repeated at night with forty drops; and on the following morning, an hour before the time of dressing him, which was to be at nine o'clock, in case of thirst he was to have a glass of port wine, or wine and water, half and half.

October 31st, (second day) says he grew easier soon after we left him yesterday, but did not remain long so, as the pain soon after returned as violently as ever, and had done so by intervals ever since. Has had a good deal of thirst, and taken above a pint of wine besides his medicines. The face is very much swollen, particularly about the lips. The face of a person in the confluent small-pox without the eruption conveys an idea of his appearance; or what is still more like, a certain stage of an erisipelas of the face. Some vesications upon the neck, which are all carefully punctured with the sharp point of a probe to discharge the serum. Some vesications upon the wrists and hands. The cellular membrane of those parts so puffed as to obliterate the feel of the artery at the usual place. His pulse, felt in the axilla, beats 130. Several vesications had appeared upon his legs and thighs, which were treated as the others. The left thigh, the buttock, and round the verge of the anus seemed to have suffered the most: a dry brown eschar appeared in different parts of the thigh. From the aspect of the face I was apprehensive of some inter-

nal cause of irritation from having inspired the flame, and the appearances altogether seemed so formidable as to leave me little hopes of his recovery ; yet being confident of the propriety of my practice, I had no hesitation in the manner of proceeding, though I might ultimately be foiled in my attempts of saving the individual. The dressings were the same as the day before ; but in addition his lower limbs were laid upon large towels, covered with hot emollient poultices, which enveloped the thighs, and came over the plasters. Several bags of poultice were ordered to be applied upon any part, in case he found more pain there than in any other, particularly over the face. The internal treatment was continued the same, except that the æther was taken from his draughts, and he was ordered forty drops of laudanum night and morning ; but to continue his wine, and have some panada, or both if he could take them.

November 1st, (third day) has been very uneasy during the last twenty-four hours. His slumbers much disturbed ; incoherent when he first awakes, and has been delirious at different times in the night. The *puffiness* of the cellular membrane of the face and hands still continues, and a degree of secretion is appearing in places where the skin had been vesicated. This is the only favourable symptom that appears to-day : had it not

not been for this I should have thought him worse, as the functions of the brain seem very much affected. Probably the same irritation which has affected the whole of the apparent cellular membrane, even in external parts that are not burnt, may be communicated by sympathy to all that membrane which accompanies the nervous system, and forms that state of the sensitive powers which we observe in coma, and in some states of fever. This is what the experienced Dr. Clark (of Newcastle) terms engorgement of the brain. The pulse was still 130; the urine small in quantity, and high coloured. He has had no motion since the accident. As his stomach will bear nothing but liquids, and as every thing now depends upon keeping up the powers of that organ, which is the great centre of sympathy, lest it should be put out of humour by cathartics, which might induce nausea, I ordered the bowels to be relieved by a clyster. The same dressings with the poultices were applied; and the diet and medicines continued the same.

November 2d, (fourth day) the clyster procured an evacuation which gave him much relief. Has had an easier night. A considerable quantity of pus is formed on places where the cuticle was off. The eschar on the left thigh is beginning to shew a disposition to loosen. The dressings are changed to the unguent e. lapid. calam. made warm by exposing

posing them to the fire, and applied as soon as possible after the others are taken off. Pulse 124. Urine more in quantity, but still high coloured. Tongue moist, and less thirst. There has been an astonishing change during the last twenty-four hours: the whole system which yesterday was labouring, and appeared nearly overcome, with the least possible mark of secretion, has re-established itself in its ordinary functions, entirely, I believe, from receiving that assistance of drawing forth, as it were, every latent power of the machine. The extent and scale of stimuli have to the utmost of my power been continued from the beginning of this case to this period; always having in view to avoid as much as possible the inducing debility from excess. The stomach has fortunately assisted me much; and I must give a due proportion of merit to the application of caloric externally by the means of emollient cataplasms, though I must observe they were not used, or meant as emollient, but merely as vehicles to convey positive heat, as they were applied above the plasters. I have never yet seen a case in which the benefits of both external and internal stimulation were so apparent, and I have no hesitation in affirming my belief, that had a less active mode of practice been adopted, this individual would have been added to the thousands who have lost their lives by an opposite treatment.

treatment. I wish to impress this strongly upon the minds of practitioners, as it may not fall to the lot of every gentleman to have an opportunity of making these comparative trials, and I wish my experience to be of use to such, and render it unnecessary for them to lose some patients before they become convinced of this TRUTH.—The wine was ordered to be withheld; the stimulating julep was desisted from, and only the anodynes continued: even these were diminished to thirty drops at night and twenty in the morning. Boiled bread and milk were ordered to be the chief of his diet; but a little ale posset was allowed with a view of not too suddenly diminishing the great stimuli to which he had been accustomed. The poultices were likewise continued to-day.

Nov. 3d, (fifth day.) The appearances to-day give me great satisfaction. He has passed an easy night. The swellings of the face and limbs are much subsided; the functions of the nervous system seem restored to their accustomed action, and the secretion of pus is much greater than yesterday.

Having in several slight instances, since my publication, seen the good effects of powdered chalk as an absorbent, I determined to try its powers in this case. Some pounds of prepared chalk were accordingly finely powdered. I put it upon a plate, and placed it in an oven, in the patient's room, to

acquire about the hundredth degree of heat of Fahrenheit's scale. Immediately upon exposing the surface of the wound by taking off the plaster, I threw on the surface of the sore as much chalk as would stick to the moist parts, and instantly covered them with the plasters previously heated. The poultices were desisted from to-day. His anodynes continued as before. Diet as yesterday.

On the sixth, seventh, and eighth days nothing remarkable happened, except that the secretion of pus, from the coming away of the eschars, was much more profuse; and on the latter day, on the different plasters, as near as I could ascertain, there would be at least a *pint* of matter. The diet and dressings, as well as the medicines, were continued the same.

Ninth day. The appearances in the morning the same as before; but in the evening, his father came to inform me he had a looseness, which attacked him about noon. A pint of julepum e cretâ, with two ounces of camphorated tincture of opium, was ordered for him to take a small teacupful of after each loose stool, and ten additional drops of tinct. opii to the night draught.

Tenth day. I found him considerably exhausted by the diarrhœa. He had had nearly *twenty* stools with great pain and irritation in his bowels. The rising to stool and the tenesmus had fatigued him
much.

much. The discharge by the bowels was not much at a time; after the first motion or two little feculent, but it had more the appearance of slime and matter. The most astonishing alteration was that which shewed itself on the diseased and secreting surface of the fores; instead of being deluged with pus as formerly, they appeared nearly dry. His pulse was slower than it had been for some time—under a hundred—which it had not been before during the accident, and was for some time up to one hundred and thirty. He was ordered to have rice milk with a little cinnamon boiled in it, and to continue the julep with creta. To what law of the system can we ascribe this extraordinary appearance? That the ninth day in accidents of this kind has to me ever appeared *critical*, may be supposed, when I recollect the fatal termination of many cases on that day, as recorded in my former essay (vide chap. iii. p. 70.)—I have likewise observed in several diseases which are generally termed inflammatory, that about the ninth day a crisis happens. Is it that the system is fatigued by this action, and that an opposite state is required as a species of antagonism, such as we observe in the retina of the eye, which ceases to act although the same stimulus is applied, and an opposite set of fibres take on the action from early association, as is beautifully illustrated by the ocular spectra in

Darwin's

Darwin's Zoönomia? Or may this too abundant secretion of these extensive and superficial sores, be looked upon as the same state of vessels which produces colligative sweats, that in some states of the system alternate with diarrhœa? On the same principle perhaps we may account for the good effects of blistering in certain stages of inflammation of the head, chest, or abdomen, with a tendency to effusion. The counter-irritation seems to suspend the diseased action of the primarily affected part. Thus it is an observation frequently made by practitioners in inflammations of the breast, that a blister not only inducing irritation where applied, but also on the neck of the bladder, more effectually relieves the original attack.

Eleventh day. If the appearances of yesterday surprised me, those of to-day have done so equally, and at the same time given me infinite satisfaction. I represented the extensive sores as yesterday having ceased to secrete with that profusion which they had done for some days before; and if I may be allowed so to express myself, a *sheet* of skin has been formed over the very extensive sores which two days ago were discharging a profusion of pus. I am confident the quantity of new cuticle formed these last twenty-four hours on the different and distant parts of the body, would require more than a sheet of letter paper to cover it; a greater quantity of
cuticle

cuticle than I ever before have seen made in the same time. It appeared as if the balance of the exhalents and absorbents had been so nicely kept, and the skinning process had been so rapid, that the wound might be compared to the surface of an agitated lake, which, on a sudden, subsiding to a perfect calm, is iced over in a single night.

The circumstance of the accidental diarrhœa has convinced me of a fact which might have remained long in obscurity, had it not been for this opportunity. It will be recollected by those who read my former essay, that in the case of E. F. in the second mode of treatment, I mention his being above a twelvemonth under cure; and I there hazard a conjecture, that it was very materially owing to an ill conceived prejudice which I had adopted of *supporting* the system under that diseased action. This case convinces me that I was right in my opinion of that case being rendered so tedious by my being unacquainted with this law of the system. Chance has here unfolded to me the necessity of restoring the equilibrium of the system, by lessening the action of the arterial system, which prejudice would have prevented my daring to adopt. To have given a severe cathartic at this period would have appeared like madness in my eyes at one time; but now I look upon it as dictated by experience.

Little

Little further need be remarked in this case. The parts continued to heal rapidly ; and in less than three weeks from the accident, (i. e. from the 30th of October to the 18th of November following) he was *perfectly well*.

This case is so decisive, 1st, of the advantages arising from the stimulating treatment to the establishing of suppuration, and 2dly, of the *extraordinary* benefit to be obtained by desisting from that plan, when that process is established, as to leave no doubt in my mind of the perfect consonance of this mode with the laws of the system. I wish others to benefit from it, and I shall be happy to hear the result, as I do not fear being put to the blush for the consequences.

CASE.

Thomas Pyle, a boy of fifteen years of age, was burnt by the same explosion with G. Clark, not quite so severely, though considerable eschars formed on some parts, and the symptomatic fever ran to an alarming height. He was treated according to the principles already laid down, both internally and externally, and was soon brought to a state of safety—i. e. the injured surface became a secreting one. Chalk was applied externally, as an absorbent, and the internal stimulus was desisted from, as before recommended ; yet the discharge continued too profuse. I have already mentioned
that

that he was not so severely burnt as Clark ; but the accidental diarrhœa produced such an effect upon Clark's system, that he was well sooner than this boy. Supposing the beneficial effects in Clark's case to have arisen from counter-irritation, I attempted to imitate this accident by a strong dose of julep and calomel. It certainly produced a very good effect, though not so marked a one as the accidental diarrhœa, as I durst not push my efforts so far as to equal what nature had done in the former case. At the interval of a week the purge was repeated ; between the purges the diet was nutritive, but not stimulating ; all fermented liquors were forbidden, and nothing *hot* was allowed to be taken. This injury required near a fortnight more than the other for its cure, though of *considerably* less import : yet, though a fortnight longer, I esteem it a *very* speedy cure, for it was completed in less than five weeks ; whereas, I am well convinced, that if a different mode had been pursued, it would have required as many months—I mean, to have cured these surfaces after they were brought to a state of suppuration. In the former, or what I have called the first mode of treatment (vide p. 70, first essay) I have no hesitation in saying he would have been lost. It is by what I term the second mode (vide p. 80, first essay) I suppose he might have been saved ; and the case E. F. (p. 93, first essay)

essay) will give some idea of the length of time required in curing such injuries upon the *old plan*.

I must here observe that I have frequently benefited in other cases from this lesson nature gave me ; and I am induced to record it that others may profit by my experience, if they dare venture to follow a practice so contrary to the prejudices of the schools.

In my first essay, p. 11, I have noticed the similarity of the materials in the explosions of mines with those of gunpowder, only the order seems to be inverted. The caloric or generated heat appears to be exactly similar ; and it will readily be supposed, that I should be induced to use the same means in accidents happening from gunpowder, as in burns of any other description. Accordingly the few of that kind which have fallen to my share, I have treated upon the same principles, and with similar good effects.

CASE.

A boy, aged ten, having his face and hands burnt from an explosion of gunpowder, I was sent for to see him in the country. His face was much burnt ; the eye-lashes and the hair of the eye-brows were much singed, more on the right side than on the left ; the eyes were consequently exposed to the same effect, and he felt very great pain in them.

They

They had applied oil to the whole of the burnt parts before I saw him, which might be an hour after the accident. He was in great pain—crying, shivering, and stamping about the room like a little madman. I gave him an anodyne immediately, and bathed the whole of the parts well with Ol. Terebinth. and dressed them afterwards with the stimulating ointment. He was immediately put to bed. I staid about half 'an hour with him, when he began to be easy. His anodyne was repeated at night. On the following day I found he had passed a pretty easy night. He was again dressed with the same ointment; in the course of two days more suppuration took place in parts about the right eye, and a great portion of the skin cracked and peeled off in scales. The dressings were changed to the absorbing ones, and in about ten days he was perfectly recovered, except a little tenderness of the eyes, which yielded to purges taken at proper intervals, and a collyrium with vitriolated zinc.

I could add many more cases of the efficacy of this mode; but as they offer nothing remarkable, and were under my own care, they would only uselessly swell this work, which, I am afraid, may even now be thought too extensive. To surgeons of the army and navy, and those employed in naval or military hospitals, I cannot too strongly recommend this mode. From conversations with
some

some public characters, I find a number of men are *expended* by explosions which happen in laboratories, in the field, and on shipboard. - It will be some consolation to me to think, that if I have it not in my power to prevent the *mad efforts* of man in going to war, yet I may be the means of saving the lives, or mitigating the sufferings of some of my species, who were brought into such situations by a concourse of circumstances, over which they had no controul. I must here beg leave to pay the tribute of thanks due to Dr. Trotter for recommending my essay to the attention of the navy surgeons. To his activity and investigation the public already owe much, and the spirit he has unfolded in the medical department of the navy, leads us to hope for much more.

I shall now adduce the testimonies of others in support of the facts I have been induced to give to the world. The following is a letter from Mr Stephen Hammick, jun. of the Royal Naval Hospital at Plymouth, whose zeal in the cause of our art is well known to medical men, and needs no panegyric from my pen.

“ *Fountain Court, London,*

“ SIR,

Sept. 26, 1799.

“ In answer to your letter, which I had the honour of receiving a few days since, requesting my treatment of burns, I beg to state, that during the last seven years, whilst I was employed

as an assistant surgeon, at the royal naval hospital at Plymouth, I had frequent opportunities of having under my care and management, a number of men who had been severely burnt by the explosion of gunpowder. At the beginning of this war it was our general practice to keep the parts constantly wet, either with vegeto-mineral water, crude sal ammoniac wash, or vinegar. Although these applications gave our patients ease for a time, yet this ease was not of long duration, neither were the benefits derived such as to satisfy our minds of their utility; as we found that our patients did not receive those permanent beneficial advantages which had been attributed to them; we therefore had recourse to rectified spirits of wine, in which was dissolved a pretty large quantity of camphor. This mode succeeded more to our wishes. But when your ingenious treatise on burns fell into my hands, I resolved to put it to the trial in the first recent case of burn that presented itself, and unfortunately I had not long to wait for such an one; to which I immediately applied the spirit of turpentine, in a full and free manner, (though I must admit that I did not give my patient, internally, the liberal allowance of spirit and laudanum which you have so forcibly recommended.) The application of the turpentine was attended with much burning and smarting, as the patient expressed it, for about an hour: at the expiration of which he fell asleep, and rested tolerably for about two hours; and when he awoke, he declared that he found himself much relieved. No ill symptoms supervened, and the process to suppuration in this case was rather more rapid than in any I had before witnessed. The after stages, however, were nearly, if not quite, as slow as in those patients who had been treated by the cold applications.—Prompted by the success of this case, I tried it in several others, and with equally beneficial effects; and from strictly watching and minutely attending to burnt patients, (my residence having been within the walls of the hospital

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tal for more than seven years) I am decidedly of opinion, that the practice of applying immediately to burns the spirit of turpentine, is the best I have ever yet seen adopted, as the process to suppuration is in general more rapid, and those irregular marks or seams found after other applications are not to be met with after the turpentine; neither is the skin so disposed to crack, or break open again, as was formerly too often the case, an event producing the most troublesome and irritable sores.

“ Not thinking ever to be called upon to give particulars of my practice in burns, I did not make any notes;—what is above stated is given merely from memory: but the success of the practice was so great, that it was engraven so forcibly on my mind as not to be easily effaced; and should you think this letter of any importance, it is entirely at your service.

“ Should you wish any further information on the above points, I wish you to waive all ceremony, and demand it from

Your obedient servant,

STEPHEN HAMMICK, jun.”

From this letter the superiority of the stimulating, over the torporising mode of treatment, is clearly decided; and it also proves that the *Oleum Terebinthinæ* possesses greater efficacy as a stimulant than the *sp. vini rect. c. camphorâ*.—I am sorry Mr H. did not pursue the whole of the mode recommended; but should further occasions present themselves, and he should try the *internal* stimulant plan to suppuration, and afterwards the plentiful use of chalk as an absorbent, I think he will then confess, that to have advanced from the chaotic state in which this department of our art was three
years

years ago, to the degree of certainty we have now arrived at, is a most rapid and highly gratifying progress towards that goal of truth where we all wish to arrive.

Mr Horn, surgeon to the Newcastle infirmary, has favoured me with the following letter:—

“ *Newcastle, 11th May, 1800.*

“ DEAR SIR,

“ I have not been able to find the account I mentioned to you, about the child who was scalded by boiling water, and who was the first patient whom I treated in the manner recommended in your book; I must therefore content myself by saying it induced me, as much as one case could do, to give your method a preference to every other I was acquainted with.

“ The colliery for which I am employed is so fortunately situated, and so judiciously managed, that no accident from fire has occurred since the year 1786, so that I have had but a very confined practice in burns. The trifling things of that nature which I have had under my care, in private practice, have been uniformly treated in your way, and the result has always added to my confidence in the method.

“ From the time of your publication until the 7th of September, 1799, I had no case worth communicating. On that night, Mr Row's tar-yard caught fire, by the blowing off of the head of a still, in which they were preparing coal oil. Several butts of this burst into flames, while a poor sailor was in the midst of them, endeavouring to push them into the river. He was very severely burnt in various parts of his head, body, and limbs. It was about an hour after the accident before I got to him, during which time the neighbours had been continually employed in anointing the burnt parts with oil, by means of feathers.

thers. The poor fellow (although very resolute) was complaining much of the severe pain. I began immediately to apply the Ol. Terebinth. from which he felt a most pleasing relief, and was so sensible of its good effects, that he carefully placed one arm under the other to catch every drop that fell from the part I was applying it to. I dressed him with ung. refin. flav. thinned with the Ol. Terebinth. and as the man was in a very indifferent lodging, I sent him to the infirmary, where you would see the event of the case. I will just remark, that from the carelessness of a person who was holding a candle, my patient had nearly undergone a second burning; and from the very inflammable nature of the turpentine, and the hurry people are in on these occasions, such a thing might easily happen.

“ The 10th of March last, I was called to a little girl, 7 years of age, daughter of Capt. Bainbridge, of the Ferry, Dentshole. Her clothes had caught fire from a hot poker, placed perpendicularly against the wall, while the child was standing near it. She was very severely burnt all over the face and breast; her neck and left arm-pit had suffered very much, and many parts of her body in a slighter degree. Cold water, scraped potatoes, and whatever the neighbours could suggest, had been used until I got there. The child was complaining very much when I began the application of the oil of turpentine, previously made warm; and although it was applied to the naked cutis, in several parts where the blisters had been injudiciously cut, she ceased to complain as she had been doing during the former treatment. While I was spreading the plaisters (of ung. refin. flav. c. Ol. Terebinth.) I desired the attendants to use the oil freely to all the parts which were suspected to have been affected by the fire, particularly to the right side of the breast, neck, and shoulder, where an appearance had taken place very much like an erisipelas, when the skin begins to form blisters. These I afterwards covered (as well as the parts more severely burnt) with the ointment

ointment spread on linen, and I gave the child a glass of brandy and water, with twenty drops of the *tinctura opii*; and another anodyne at night with fifteen drops.

“ Next morning I found she had passed a very quiet night, of which her mother’s expression will give you a better idea than any thing I can say. On my asking her how the child had been? “ Finely,” (says she) “ she has never said *Oh dear!* since you left her.” I removed the dressings, and was much pleased to find the parts where the skin was just beginning to form blisters, in the manner I have before mentioned, had gone no further in that process. They now assumed a brownish appearance, and no other effect was produced in the progress of the cure, than a desquamation of the cuticle.

“ The cheeks and parts where the burns had been deepest, were covered with a thick yellowish crust, of a purulent and somewhat *curdly* appearance. The oil of turpentine and the ointment were continued the first four days; after which she was dressed with a cerate of wax and oil, and I had no other trouble in her cure than being obliged to apply occasionally a little of the vitriol. *cærul.* to a fungus which arose on the wound in the neck. I discontinued my visits on the 6th of April, and yesterday I saw the child, who is very little marked, and that merely where the parts were most severely burnt.

I am, dear sir,

Your’s truly,

FREDRICK HORN.”

I feel myself much obliged to Mr Horn for the above letter, and also for his scrupulous attention to the *whole* of the treatment according to the plan of my essay. The minute attention paid to the case, and the *decided* benefits which arose from the treatment, will produce a proper effect on the medical reader.

Mr Fife, furgeon, Newcastle, has favoured me with the following letter :—

“ DEAR SIR,

“ Since you favoured me with your ideas on the treatment of burns, I have had frequent opportunities of trying the Sp. Terebinth. as an external application, and I feel peculiar satisfaction in stating, that in every instance the employment of it has been attended with uniform success.

“ As I am not engaged in colliery practice, the cases which have hitherto come under my care, have been principally of the nature of scalds ; and when I contrast them with similar cases conducted under a different order of treatment, the result is truly astonishing.

“ The first that I shall notice is that of John Weather Spoon, a brewer, who, on the 25th of November, 1797, fell into a copper boiler : they had fortunately just before pumped off the greatest part of the boiling wort it contained, so that not more than eighteen or twenty gallons remained in the copper at the time he fell : he was, however, most severely scalded ; and I being immediately sent for, saw him very soon after : I found him almost frantic with pain, and trembling to as great a degree as any one I ever saw during the cold stage of an ague. On taking off his cloathes the epidermis peeled off from the whole scalded surface ; the parts which had suffered the most materially were the lower extremities, back and one arm. I gave him a draught containing fifty drops of laudanum, and immediately began to apply very liberally the Sp. Terebinth. to all the affected parts. At first he complained of increased heat and smarting, but this was quickly succeeded by a soothing sensation ; and continuing to apply it some minutes longer, he said he felt himself almost quite easy. As a dressing I now made use of the ung. refin. flav. rendered soft with the Sp. Terebinth.
and

and being put to bed, the shivering soon went off. He passed a tolerably quiet night, and on removing the dressings, the next day, the scalded surfaces appeared clean, florid, and very moist, with a copious thin secretion. The ointment was again applied, but with a less proportion of Sp. Terebinth. On the third day the secretion put on a purulent appearance: the Sp. Terebinth was now entirely omitted, and the parts dressed with ung. refin. flav. alone. By the fourth day suppuration was completely established, and the surfaces exhibited a healthy aspect; and as the discharge of pus was considerable, I laid aside the ung. refin. flav. and substituted the cerat. e. lapid. calamin. which was continued until he got quite well. In less than a fortnight from the time of the accident, the arm which had been stripped of its epidermis from the shoulder down to the fingers, and a great part of the back and legs were perfectly cicatrized; the only parts then remaining open were about the ancles and the lower part of the back, and these were healed in the course of the week following, so that his cure was complete within three weeks from the accident. He was allowed to live as usual without restraint, and his health and strength were very little impaired.

“ This case brought to my recollection one of a similar nature, which occurred about sixteen years ago: this patient was a brewer likewise, and he by some accident slipped into a boiler nearly up to the knees; the epidermis came almost entirely off with his stockings, and he suffered extreme pain, with repeated shiverings. A liniment, composed of equal parts of the ol. lin. and aq. calcis, was plentifully used for some time to the whole scalded surface, over which soft old linen, spread with ung. e. spermacet. was applied; opiates were given to assuage the pain, but at the same time the antiphlogistic regimen was strictly enjoined until suppuration took place, which I remember was very profuse; he was then allowed a more generous diet, but the discharge continuing very great, he became much reduced in

flesh and strength, and the cure proved extremely tedious, in spite of every care and attention: to the best of my remembrance it was between three and four months before he got quite well.

“ Were it necessary, I could mention several other cases of different degrees of injury, in all of which the external use of *Sp. Terebinth.* proved equally serviceable; but not having particularly recorded them, I shall only observe, that in every trial I have made, the result has been so highly satisfactory, as to leave the fullest conviction in my mind of the superiority of this mode of treatment over every other I am acquainted with.

“ Allow me now to acknowledge the obligation I feel, as an individual, in being thus enabled to afford more effectual relief to such as may require my assistance; and I think it but justice to say, that the profession, as well as the community at large, are much indebted to you for your indefatigable exertions in the improvement of this important branch of surgery.

I am, dear sir,

With great esteem,

Yours very sincerely,

Westgate-Street,
May 20th, 1800. }

WILLIAM FIFE.”

The above testimony of Mr Fife is interesting and satisfactory. I know few men more capable of making the comparison: his talents for observation and discrimination are well known to those who have the pleasure of his acquaintance.

I am favoured with the following letter from Mr Bell, surgeon, of Chester-le-Street, in the county of Durham, which adds weight to the evidence already given:—

“ DEAR

“ DEAR SIR,

“ I have just completed the cure of a person severely burnt, and it is the first time I have had it particularly in my power to adopt the method of cure so justly recommended by you in your late publication. The patient was a workman at the brewery in this town ; and in February last, on descending by means of a ladder into a large copper or vessel, in which was some boiling wort, (to rectify something that prevented the free evacuation of the liquor out of the vessel) his foot slipped off the ladder, he fell on his side, and on attempting to extricate himself, he again fell, by which his legs, arms, &c. (particularly his right leg and arm) were severely scalded. As I was much engaged in general business at that time, I had not leisure to write down the particular circumstances of the case as they occurred, (which I much wished to do) ; however, I had much pleasure and satisfaction in finding, that your method, hitherto new to me, succeeded to my utmost wishes, and better than any mode I have before seen, and shall in future be the rule of my practice in such cases.—Should any thing of the like kind occur to me, I will take the liberty of communicating it to you.

I am, dear sir,

Yours faithfully,

RICHARD BELL.”

Chester-le-Street,
May 4th, 1800. }

Mr Bell, surgeon of his majesty's sloop Pelican, in a letter to me says “ Another case, besides that I have mentioned in the Medical Journal, occurred during our passage from Lisbon, that I think deserves notice :—A man was standing near to the cook's coppers, in which salt pork was boiling, drying a pair of trowsers, during a hard gale of wind, when

when the ship *lurched* so much as to throw a quantity of boiling water and grease over that side of the boilers where he stood ; he received the greatest part of it upon his arms and hands, and complained of most violent pain. The Ol. Terebinth. was instantly applied warm, and in about an hour he became easy ; on the following morning they were found perfectly *cured*, except a small place on the left wrist, where the epidermis had been stripped off by endeavouring hastily to wipe off the hot grease with his trowsers. I think this case speaks sufficiently for itself, and I shall only add that the small place mentioned was well in *four* days." I shall not comment upon this case, but leave the reader to form his own conclusions.

In a case related by Mr Bell in the Medical and Physical Journal, vol. iii. p. 296, it is mentioned that an infant who was scalded, very soon fell asleep after it was copiously bathed with the Ol. Terebinth. and that it had also a *remarkably* good night. Mr Westgarth, an ingenious pupil of mine, has also remarked this anodyne quality of the Ol. Terebinth. when applied to the irritated surfaces of young children, in some cases he saw in the country. I am induced to account for this fact in the following manner :—Heat to a certain degree produces pleasurable sensation ; beyond that it excites pain. Now if we can *nicely* lower the action, we shall again

again come to pleasurable sensation. Sensation produces sympathetic effects through the system; when these are of the pleasurable tribe, the *thoughtless vegetative* system of a child is soon placed in that state known by the name of sleep: it is also a very frequent effect produced upon older subjects, although they are liable to a mental stimulus. A good dinner and a few glasses of wine frequently produce this effect on grown people.

APPENDIX.



SINCE the foregoing was sent to the press, I have been favoured with a complete treatise upon the subject of burns by Mr George Wilkinson, of Sunderland, member of the Medical Society of London, of the Royal College of Surgeons, and honorary member of the Chirurgo-Physical Society of Edinburgh, &c. The introductory discourse contains many ingenious and judicious arguments, pointing out the causes of the absence of principle, as well as the absurdity of the modes generally resorted to in accidents of this class: but these observations exceeding the limits I had prescribed myself in an essay of this kind, and Mr W. wishing only to display the powers of the new mode of practice, has been kind enough to allow me to extract the cases, for which he has my thanks, as they are highly satisfactory, and prove the universality of the principles developed in the former essay.

CASE I.

On the 15th December, 1797, a woman, 27 years of age, subject to fits, was attacked by one of them in the act of taking from the fire a pan of boiling water, which overturning, scald-
ed

ed her face, neck, and breast ; by falling against the hot grate, the palms of her hands were likewise burnt. The agony she suffered was extreme : her eye-lids closed and swelled. The whole of the parts injured were liberally bathed with *sp. vini rect.* and covered with the liniment, as you have directed, composed of *ung. refin. flav.* incorporated with the *Ol. Terebinth.* The relief obtained by this mode of treatment was truly wonderful, it seemed to operate as a charm. As this was the first instance that occurred in my practice, I could not help feeling a high degree of satisfaction at the astonishing ease given by the stimulating plan. An anodyne being administered, she passed a tolerably good night. The same dressings were used the day following, and the inflammation seemed to be subsided. But as this person was not my own patient, and I attended only on the account of another gentleman who happened to be out of town, and who, after this time, attended her himself, I am unable to particularize the treatment he subsequently adopted ; whatever it might be, I found, on enquiry, that she recovered very rapidly. The gentleman acknowledged the fact, but deemed the quantity of *sp. vini rect.* which was got from his shop on this occasion, and amounted to above a pint, highly extravagant. He said he had lately used vinegar, and was an advocate for Mr Cleghorn's plan, which he had successfully adopted in several cases. I had done the same ; but from the great superiority of this new mode of treatment, in the *quickness of the cure, and the sudden cessation of pain*, I determined to persevere in the same treatment in future.

CASE II.

Elizabeth Frazer, an infant, aged three years and an half, on the forenoon of the 5th January, 1798, sitting on the floor, and having no other covering but a light outer garment, was
 terribly

terribly scalded by a large iron pot full of boiling water slipping suddenly from the fire. On my arrival very speedily afterwards, I found that the posterior part of her thighs, buttocks, (particularly the right) part of the left leg to a considerable extent, the exterior part of the right leg, near the ankle, the right groin, and *mons veneris*, were the parts on which the injury was principally inflicted. These being well bathed with the Ol. Terebinth. and covered with cloths spread with the ointment described in the former case, the child received relief almost instantaneously. This was experienced during the bathing of the parts: for on my entering the room, her cries were piercing; but by the time she was dressed, which took up about twenty-five minutes, or little more, they had subsided to sobs. Being put to bed, a gentle anodyne was administered, and she very soon fell asleep, and passed a tolerably easy night.

The day following she was again bathed with the Ol. Terebinth. and the same liniment was applied. The posterior parts, such as the buttocks and thighs, from pressure by lying on her back, were abraded of their cuticle, part of which came away with the dressings. The anterior vesications on the belly and other parts taken notice of, which were entire, were now punctured.

The third day, January 7th, suppuration had begun to take place upon those parts from which the cuticula had separated: these were dressed with the ung. e lapide calamin. The parts on which the skin had remained after being punctured, were still dressed with the liniment.

Fourth day, January 8th, the whole were dressed with the cerate, which was continued throughout the course of the cure, which took up just sixteen days, those parts on which the cuticle remained being healed up by far the soonest. The anodyne was administered for about three nights only, it being no longer necessary. Three doses of calomel e pulv. cathartic.

were

were given at intervals towards the latter end of the cure ; and, strange to say, this child, although very delicate and puny, from being previously affected with the whooping cough, recovered most surprisngly, and that to the astonishment of all the spectators who saw her, many of whom scrupled not to declare, that they had known accidents of far less consequence, oppositely treated, take up more than double the time occupied in this instance. "

CASE III.

Another infant, Elizabeth Catty, aged only seventeen months, was on the 21st September, 1798, by a similar accident, scalded shockingly. The injury extended from above the left knee down the whole external surface of the leg and ankle, and on the right arm from the top of the deltoid muscle to the articulation of the joint of the elbow, spreading to the fingers down the exterior surface of the arm, and also the greatest part of the right cheek. The screaming of this little creature on my entering the room, which was almost immediately after the accident, was lamentable, and she was shivering as if in the fit of an ague, a circumstance I ought to have noticed in the two former cases. The Ol. Terebinth. was applied liberally with a feather : I could plainly perceive, during the process, that the pain gradually diminished, so that by the time she was dressed with the liniment ex Ol. Terebinth. ung. refin. flav. which took up more than half an hour, she had nearly ceased crying. As I had heretofore given an anodyne after the first dressing on former occasions, I omitted it in this case, with a view of ascertaining the full effects of the application in appeasing the pain. An hour after this I saw her again ; she appeared quite easy, and soon after slept, but was disturbed at intervals by the recurrence of pain, which was always mitigated by moistening the dressings

fings as they became dry, with a feather dipt in Ol. Terebinth.

On the 22d the appearances of the parts were very promising, (although she had now and then been disturbed in the night) and the inflammation was pretty much abated, particularly on the face, right arm and hand, and part of the left leg. The deltoid muscle, elbow joint, part of the arm, and below the knee, were covered by large and extensive vesications, which were carefully punctured, and the dressings again applied as before.

The 23d, some portion of the cuticle came away with the dressings about the elbow, and a little below the knee, these parts having just begun to take on the suppurative process: they were, however, once more dressed with the stimulating applications.

The 24th, a plentiful discharge appearing, the whole of the parts were dressed with the cerate e lap. calam. The swelling of the face in particular, and indeed of the whole, had subsided; the former being about to heal, as the cuticle was now beginning to peel off dry. But these surfaces abraded of their cuticle, that had suffered the most from the hot water being longer in contact, seemed to feel much on their exposure to the atmospheric air, a circumstance that almost invariably takes place, particularly in cold and frosty weather. Hence arises the absolute necessity, (which I wish strongly to inculcate) of humanely lessening the miseries of these unfortunate objects, by always having the new dressings ready, prior to the removal of the old ones.

The 25th, the discharge was by no means diminished, but as she had appeared peevish and restless for the last two nights, a small quantity of an anodyne julep was directed to be taken at bed-time, more especially as she was about her teeth, and was affected with a moderate looseness. From this time the sores began to heal rapidly, and the whole cure was completed in
about

about sixteen or seventeen days. A gentle purge or two were exhibited towards the latter end, to obviate the costiveness caused by the anodyne. The tenderness, and disposition of the skin to fret and crack, which often takes place after the cuticle is first formed, was relieved by the application of the liniment *ex aq. calcis c. ol. lini*, which also prevented the contraction of the muscles surrounding the joint.

A brother of this child, about six years of age, was hurt by the same accident: his left foot was much scalded from above the ankle exteriorly to the heel; and the injury included nearly half the foot: the boiling water had undoubtedly been in contact with it for a long time, as a large vesication, about the size of a duck's egg, occupied the foot. I did not puncture it for three or four days, when fearing it might be broken accidentally, and the cuticle thereby be torn off, I was induced to do it. He was treated exactly in the same way as his sister, and obtained ease from the same applications; but his cure, (I mean the healing of the fore) took up nearly a month.

CASE IV.

John Reed, aged 13 years, apprentice to Capt. David Hughes, of the ship *Elizabeth*, of Sunderland, while setting fire to a composition of gunpowder, in the street, on the night of the 15th January, 1799, a spark of fire came in contact with some gunpowder he had imprudently put loose in his waistcoat pocket, and he was thrown by the explosion to a considerable distance across the street, its violence being such as to raise him some height from the ground. He was immediately taken to the dispensary, which was near to the place where the accident happened. All the injured parts were anointed with the liniment *ex aq. calcis, et ol. lini*, before I saw him. On my arrival, I found him shivering, as if in the

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cold

cold fit of an ague, his teeth chattering, and he complained of great pain and intolerable heat over his body, *not being in the least relieved by the applications which had been used.* I removed the dressings, which I discovered to be the cerat. e lap. calam. put over the liniment. I lost no time in applying the Ol. Terebinth. made warm by placing it in a small bason, surrounded with hot water, while my assistant was spreading the cloths with the liniment used on former occasions. The extent of the injury was very considerable in this patient: the belly, above the *umbilicus*, and the right side of that region, with a considerable portion of the left, and some parts below it, were much scorched; a large portion of the skin of the right pectoral muscle, the top of the right shoulder, nearly the whole of the face, but particularly the lips, the inside of the mouth, nostrils, and a part of the breast and left shoulder, a large portion under the right axilla, which was discovered on the ensuing day after dressing him, as also a small part near the false ribs, posteriorly, were much burnt. An anodyne cordial draught, containing about thirty drops tinct. opii was exhibited, and he passed as good a night as could be expected, his sleep being disturbed by some paroxysms of pain.

The ensuing day, on dressing the parts, the injury they had suffered was discovered, to the extent already mentioned; the eyes and eye-lids fortunately, however, had escaped being hurt. Innumerable small particles of the gunpowder were found sticking every where, particularly about the belly, breast, face, &c. surrounding as it were the eschars, which in many places were deeply seated, and extensive. The face being less injured, was now anointed with the liniment ex aq. calcis et ol. amygd. and a small portion of camphor; the rest of the parts were dressed as at first. A saline mixt. c. conf. card. was exhibited, and the anodyne was repeated at bed-time; his pulse was at 115, and he complained of thirst.

On the 17th, he was easier than on the day before, the appearances of the parts in general were favourable, particularly the face; the pulse still continued at nearly the same standard.

On the 18th, he was much the same as the day before; some parts had put on the appearances of suppuration around their edges: these were dressed with the *cerat. e lap. calam.* and those on which it had not taken place, had the former dressings applied. The medicines as yesterday were continued, and the patient being colic, an enema was injected, which, with the assistance of two or three grains of calomel, procured some motions; his pulse was reduced to 90; the anodyne was continued at bed-time.

On the 19th, he felt much easier, having passed a very good night. Some more of the eschars on the belly, breast, and shoulders, appeared to loosen; those under the axilla felt very troublesome: the face, nostrils, lips, and mouth appeared to mend rapidly. The discharge in this patient, which had begun to take place, smelt very strong, and considerably foetid, much more so than in any of the former cases described.

On the 20th, (sixth day) the stimulating plan was gradually withdrawn, both with respect to external applications and diet; the former being now changed entirely to the *cerat. e lap. calam.* From this period to the twelfth day, the amendment became visibly progressive. The face, (as I have invariably observed in almost all cases of this sort, although in this it was by no means so much injured as other parts) was the first that healed. This, with great part of the breast and shoulders, had taken on the skinning process. The eschars, which were deeply seated on each side of the umbilical region, as also that near the axilla, did not separate completely till about the eighth or ninth day. The surfaces of the tender sores, previously to the application of the cerate, were well dusted through the perforations of a tin box with *pulv. e creta pp. et pulv. amyli*, in the

proportion of four parts of the former to one of the latter. This method I had adopted on a former occasion of a most alarming and dangerous nature, (which will be the subject of the following case) with uncommon success. The gleety troublesome discharge which always takes place in desperate and deeply seated injuries of this sort, and also the pain and irritability were by these means much lessened, and the cure rapidly advanced, which in this severe case was effected in about thirty days; and what is also pleasing, no unseemly scars ensued, a circumstance that has scarcely ever failed to happen in such cases under the old treatment. His bowels were kept open during the cure by clysters, and he was occasionally purged with calomel et pulv. cathar. towards the end of the time. He kept his bed for the first ten or twelve days, after that time he sat up in the day time, and on the twentieth day went out of the house, coming afterwards every day to be dressed at my house.

CASE V.

On the 6th November, 1798, Mrs E. Foreside, aged 56, lately resident in Sunderland, but now living at No. 20, John's Street, Surry Road, Black Friars, while reading, about eight o'clock at night, it is supposed she had approached too near the candle, being alone at the time, and was found sitting upright in a blaze on the floor, while the candle lay burning by her, the flame of which had not only penetrated through a thick oil-cloth, but had actually communicated to the boards. How long she had continued in this situation cannot well be ascertained; but when the woman with whom she lodged found her in the position above described, she was burning, and in a state of stupefaction. On my entering the room she scarcely uttered a syllable, and appeared to feel but little all the time I was dressing

dreſſing her, which, from the nature and extent of the injury, muſt have taken up a conſiderable extent of time.* The parts expoſed to the contact of the fire were conſiderable; they extended from under the right ear a little towards the ſhoulder, and in the direction of the maſtoidæus muſcle, including the clavicle from its articulation with the arm to the ſternum, and nearly the whole of the pectoral muſcle, advancing towards the axilla. Below this, it was ſeparated by a ſmall ſpace, and covered the ſuperior and anterior portions of the right mamma, juſt above the nipple. The burn in this part was nearly three inches acroſs, and two and an half from above downwards. In the centre of the ſternum, immediately below the inſertion of the ſterno-maſtoidæus muſcle, appeared a ſpace above an inch and an half in breadth, and more than an inch from its ſuperior to its inferior termination, and again beneath, another ſpace preſented itſelf, of a ſize ſomewhat leſs. The greateſt part of the right ſhoulder blade, extending croſsways three and an half inches, and more than two and an half from above downwards, appeared to be moſt dreadfully affected, and the injury very deeply ſeated. From the top of the left ſhoulder, beginning immediately below the glenoid cavity of the ſcapula, a ſpace covered the whole of the deltoid muſcle, from above downwards, and extended a little forward to the left pectoral muſcle, and ſomewhat backward to the ſame ſhoulder. Immediately above the left eye-brow a large eſchar appeared, in ſize an inch and an half acroſs, and an inch from below upwards.

But

* The ſhivering or rigour uſually attendant on accidents of this ſort, and which is more or leſs vehement, according to the degree of danger, extent, or violence of the injury inflicted, was in this inſtance abſent. How far this is to be imputed to the effects of terror operating powerfully upon the nervous ſystem, and thereby depressing the vital energy, I ſhall not take upon me to determine.

But the worst of all was the crown of her head, which was scorched most terribly. The fore part being defended by a cushion, over which her hair had been laid, was preserved from injury. The breadth of this eschar was three and an half inches, and its length, extending across the head, somewhat less than five inches. The cuticula on this part seemed quite destroyed, and no appearance of vesication presented itself. The whole of the cutis in general was dreadfully scorched; that on the fore parts of the body, from the ear, clavícula, breast, &c. appeared of a dirty white, or ash colour, interspersed with some streaks of a reddish hue; that on the left arm and right shoulder blade was hard, dry, and contracted, of a dark brown colour; and that on the top of the head almost black. She was dressed with the Ol. Terebinth. and the liniment was applied as usual over the whole surface of the parts injured, and an anodyne, with 30 drops of tinct. opii, was immediately given. The diet was directed to be rich and nourishing.

Nov. 7.—She had passed but an indifferent night, had some small intervals of repose, but at times appeared uneasy. She had come more to herself, but appeared much dejected, and spoke but little. The appearances of the parts much the same as yesterday; her pulse 114. She was ordered a saline cordial mixture, and the anodyne was again repeated at bed-time. She was allowed rich negus, and whatever kind of food she pleased. The eye-lid being tumefied, from an idea of the Ol. Terebinth. being improper, I ordered a solution of the cerussa acetata to be applied constantly to it.

Nov. 8.—The appearances of the injury much the same; the medicines and diet were continued, pulse the same as the day before.

Nov. 9.—She seemed much the same, excepting that she felt her eye-lid very sore, and said it had given her more pain and uneasiness than any other part. At this time a disagreeable vapour

vapour seemed to arise on taking off the dressings, which began to exhibit some moisture.

Nov. 10.—The neck, pectoral muscle, and some parts of the breast, appeared moist around their edges; the eschars on these parts had begun to separate, but no alteration appeared on the left arm, right shoulder blade, or top of the head, which were hard, dry, and contracted. The same dressings were still continued as at first, as was the anodyne at bed-time, and a few grains of calomel c. pulv. cath. to procure a motion, which she now wanted, were given. Her pulse had fallen to 100.

Nov. 11.—The discharge from the parts which were above-mentioned to be in a suppurative state, was now considerable, and smelt most remarkably fœtid, so as to be quite distressing and insupportable to the patient, and even to myself. Some sloughs had come away from the sternum, and part of the right clavicle: the eschar above the eye-brow had begun to separate, but she complained much of it. It was dressed with the cerat. e lapid. calam. as were those other parts which had separated their sloughs.

Nov. 12.—From this period to the 20th, nearly the whole of the eschars had gradually sloughed away: the discharge continued to be very profuse, and had somewhat abated of its fœtor: the patient appeared much dejected, nervous, and irritable, although she was easier with respect to pain; and when I purposely omitted the anodyne, she felt worse for want of it. She took decoct. cort. c. ang. conf. card. with evident advantage. The large and extensive sloughs on the left shoulder, right shoulder blade, and top of the head, had not been cast off; all of these, however, discharged freely; the two latter, viz. the top of the head and shoulder blade, being remarkably deep seated, I was induced to continue for a much longer time the stimulating applications, and digestive to them. I was extremely apprehensive that the pericranium had been injured, and so far was I

from being in haste for the removal of this slough, and that on the shoulder blade, that I suffered them to be completely detached before they were taken away. That on the head was not removed till about the twenty-first day from the accident, and that on the shoulder blade some days later. I state these particulars, because I generally perceived that the outer edges on which the operation first took place, had even begun slowly to assume the healing process, prior to their complete separation. In the interim the raw surfaces of the sores were well dusted with pulv. e creta. pp. subtil. levigat. prior to the application of the dressings, the parts being previously washed and cleaned round their edges with a soft sponge. The weather being frosty, my patient felt very uneasy from the atmospheric air, always having much pain on its access. The creta appeared to answer the purpose of a complete defence, and occasioned the dressing to be much less painful. The first two or three days that the creta had been used, my patient felt herself disordered in her whole system: no irregularity had been previously committed in her diet, neither were her bowels lax, or costive, nor were the sores more painful; but she was about this time seized with gripes, and a profuse diarrhœa, although the anodyne was still continued at bed-time. At other periods prior to this, she had usually been costive, and it was found necessary to keep her open with gentle purges. An idea then occurred to me, that it might proceed from some chemical combination that had taken place from the creta applied so freely. It was then that I thought of combining it with the pulv. amyli as mentioned in John Reed's case, and I have since applied it to the denuded surfaces in that form. By the use of the julep e creta c. conf. card. et decoct. cort. angust. together with a decoction of rice, in which a small portion of radix tormentillæ e cort. cinnam. was boiled pro potu commune she revived apace. The cicatrization advanced pretty rapidly on the sternum, pectoral muscle, and

and clavícula. Various islands seemed as it were to arise, which became continents, and were followed by a succession of smaller islands as the skin covered the sores, in a variety of directions. The misery this poor creature suffered was extreme. The podex by continual pressure became painful and sore, (as she was unable to lie on either side, but was propped by soft pillows) it was defended by adhesive plasters of the ung. litharg. The anodynes were continued, with some intermissions, to the 14th December, and then left off. Her appetite was various, sometimes failing very much, but was usually restored by the cort. angust. which I tried alternately with the cinchona, but always found the former agree much better. Absorbents, such as magnesia, given with conf. card. et aq. menth. e kali, pp. produced great benefit when she appeared uneasy at her stomach, which was sometimes the case, and never failed to remove the acidity which prevailed at times. Notwithstanding the unpromising appearance of the deep and large surface that covered the right shoulder blade, it healed pretty fast after the separation of the eschar, which appeared the most deeply seated, and much sooner than the crown of the head, or that on the part of the arm covering the deltoid muscle, this last being less pressed upon, as she inclined most to rest on the left side. The right shoulder blade seemed to benefit from the warmth and pressure that took place. While the skinning process was going on, which, in such extensive sores as existed in this subject, is a work of slow progress, my patient became often peevish and remarkably ill tempered. Having been indulged to live freely from the first, she was not easily restrained to a more abstemious diet; hence the discharges were profuse, and frequently acrimonious, fretting and irritating the parts with which they came in contact. It was in this state of the case that the absorbent powder already described was of most singular benefit, not only in absorbing the moisture, but defending the tender parts already cicatrized,

cicatrized, and moreover, relieving the intolerable itching which arose. Paroxysms of fever now and then intervening towards the evening, and her pulse being full and increased, she was purged with calomel et pulv. cath. in the form of a bolus; and when this proved not quite sufficient, as sometimes happened, she took at bed-time, (the opiate being omitted) pil. ex colocynth. c. calomel. The benefit she experienced from this treatment was visible, and the troublesome discharge became less and less. The period of time taken up in healing the anterior parts injured was about ten weeks; but the right shoulder blade, the left arm, and the top of the head were so much injured, that their cure took up about six months. The head and left shoulder, after being cicatrized, repeatedly became inflamed, and broke out afresh from the scratching caused by the itching. The hair beginning to grow, notwithstanding the head was often carefully and close shaved, it of course remained tender for some time after.

Occasionally the granulations, which arose above the surface, were touched by an armed probe dipped in a solution of the cuprum. vitriol. cerussa acetat. et zinc. vitriolat. made of such a strength as not to give great pain; and the cracked parts already skinned were anointed with ol. amygd. c. camph. et aq. calcis. The patient is now alive, in an excellent state of health, and from the few seams which now remain, (and which are hardly deserving of the name) it will scarcely be credited that her sufferings were equal to what I have described.

Mr Kentish was consulted in this case about the twelfth day; he advised the application of the chalk, which I found of great use. I afterwards added starch powder to the chalk, with a very good effect. This application I have continued ever since in my general practice.

The following case in Mr Wilkinson's treatise was meant to contrast the consequences of the different

different methods of treatment : as it strongly illustrates the superiority of the stimulant mode, and adds one more to the recorded cases of victims who have suffered from the practitioner being unacquainted with these principles, I am induced to lay it before the reader.

CASE VI.

On the night of the 14th December, 1788, a child of my sister's, aged seventeen months, and at that time in perfect health, unfortunately fell backward into a large iron pot, which contained a quantity of hot water, and had just been removed from the fire. At that time she had on a loose garment above her shift. She was instantly taken out, and the whole of her drefs removed. On my arrival about half an hour after, I found her shivering in a most violent manner, as if in an ague fit ; while by her shrieks and cries she appeared to be in great agony. The parts injured were about three inches in breadth, situated between her shoulders, just below her neck, a part of each shoulder was also included, and the burn extended, somewhat less in breadth, down the course of the spine to her loins. In pulling off her clothes nearly the whole of the cuticula was torn off, except some small vesicles on the exterior parts of the shoulders. Soft cloths well soaked in the aq. saturnini (Goulard's) were applied, and continually repeated, as cold as could be made, at intervals during the night, and an anodyne was exhibited.

Second day.—The same applications were continued : she had passed a very troublesome night, being often disturbed by paroxysms of pain : the anodyne was repeated, and she was kept as cool as possible. Her diet consisted of sago and panada,
given

given cold, and a mixture was given c. fal. nitri, &c. to obviate inflammation, and keep down the fever.

Third day.—The cloths adhering to the sores, which appeared dry, and of a darkish red hue, without any moisture, they were dressed with the cerat. e. lap. calam. and cloths dipped in the aq. saturn. applied over the whole as cold as possible. The parts now appeared tumefied and inflamed.

Fourth and fifth days.—The swelling still continued, without any appearances of secretion on the surfaces. The poor creature felt most sensibly on taking off the dressings, shivering at every application, as they were still applied cold, and the cold wash still repeated. The terror this sensible little creature expressed every time she was to be dressed, and which never will be effaced from my mind, formed the strongest contrast to the sensations of E. Frazer and E. Catty, the other children, whose cases I have already mentioned; they expressing a sort of pleasure, and scarcely ever uttering a whimper, or appearing to dread me; except while taking off the dressings. At this time the pulse felt very quick, and being costive, a grain or two of calomel was given to open the bowels.

Sixth and seventh days.—No appearance of the eschars separating, nor had any moisture or discharge proceeded from the smaller vesicles, which had subsided, except what might be occasioned by the dressings, which were the same as before. The pulse continued quick, and somewhat irregular; and a considerable degree of irritability seemed to pervade the whole system.

From this period to the ninth day, she appeared much sunk, weak, and even comatose. The appearances of the sores were very unpromising, and there were no signs of pus, or separation of the sloughs. She had been allowed wine, or any thing nourishing, and even some decoct. cort. peru. to all of which she now seemed quite averse. Her pulse, after this, was extremely low,
tremulous,

tremulous, and irregular ; she took very little support, and all medicine was discontinued as inefficacious. Deglutition was impeded by a convulsive hiccup; the tumefaction of the parts entirely subsided, and the inflammation seemed to be quite gone. The eschars were of a brown colour, and emitted a fœtid vapour, indicating putrefaction. She continued in a state of stupor till the eleventh day, when she was happily released from her miserable existence.

From the observations I have made in the introduction, it will appear how pernicious I esteem the generality of systems to be. Had I been less decided in my opinion, Dr Underwood's treatise on the diseases of children would have determined me. It has this moment been put into my hands, in time to notice it. Under the head *AMBUSTIONES*, page 106, volume 2, scalds and burns are treated of. The doctor allots four pages to this subject: the remedies are *wine, brandy, spirit*, and *holding the part to a moderate fire*; on the other hand *lime-water, with litharge-vinegar, cold water*, and *ice*, to be renewed day and night; but the best remedy, according to Dr. U's opinion, is a liquid soap, made with six ounces of oil, ten ounces of water, and two drachms of aqua kali. He says, "could a person, scalded all over, be instantly put up to the chin in a cold bath of this kind, and the head at the same time be frequently immersed, or well washed with the liquor, I believe very little injury would

would ensue." What contradiction!—It is hardly possible to suppose he could have collected a greater confusion of ideas in the same space. The medical reader I refer to the work; and caution the public from forming their opinion on this part of the doctor's advice. To argue on this farrago of opposite prescriptions (for there is no pretension to principle in the whole section) would be useless, as in the second chapter of my former essay, the heterogeneous opinions of authors for centuries past are canvassed. Dr U. in a note at the end of this article, says, "for some new ideas on the nature of burns, and their treatment, the reader is directed to an essay written by Mr Kentish, 1797." The doctor certainly has not read the essay he refers to, or he could never have written the article as it at present stands in his work. He likewise mentions Dr Perkins' tractors, and very properly adds a caution not to trust to them. Dr Warwick, of Rotherham, informs me, that to cure a person in his neighbourhood of the belief in Perkinism, he allowed his hands to be scalded; the one was *tractorised*, and the other was done nothing to; they both went through their different stages in the same time and manner, in respect both to inflammation and pain, and healed together. The character of Dr. W. is such as to leave no doubt of the *non-effect* of the tractors in this, and in all similar cases.

In

In the former essay I recommended the use of stimulants to the point of suppuration ; and this essay had for its object, chiefly, to point out the use of absorbents and cathartics in the stages from suppuration to the cure. The following case by Mr Horn so strongly illustrates the utility of these modes, that I have delayed the publication to be enabled to give this account. Mr H. had followed the practice recommended in my former essay, fully, freely, and judiciously to the point of suppuration : on the eighth day I saw the subject of this case ; there was a profuse discharge of thin ichorous matter ; the application of chalk was recommended ; from accident it was not applied to the hands, and afterwards but to one in the first instance : the marked advantage it had over the application of the poultice is set forth in the case. The state of fungus, so difficult to be repressed by the old mode of treatment, by this seems to be nearly prevented ; for the parts skin so rapidly as to hinder the establishment of an ulcerous state of sore.

“ Newcastle, 25th July, 1800.

“ DEAR SIR,

“ I have great pleasure in communicating to you another instance, where your method of treating burns has been successfully employed.

“ George Smith, an under-viewer, in Ravensworth colliery, was severely burnt on the 3d July, 1800, by a quantity of inflammable

flammable air taking fire in the pit, into which he had just descended to give directions to the workmen. The explosion was so violent as to drive up stones, &c. to the top of the shaft, (above sixty fathom); and the shock was felt, and the report which accompanied it was distinctly heard, by some farmers who were in bed in their houses, at some distance from the place.

“ I found him two hours after the accident, with his hair singed close to his head. The whole cuticle was peeled off from his face and neck, which were quite black with the fine coal dust, which had been driven so forcibly upon them. He was burnt in different places about his loins, and from the knees to the ancles, except some small patches where the skin had only been scorched.

“ On looking at his hands I was shocked with their appearance: on taking hold of them, the skin and nails came off exactly like a torn glove, and the extensor tendons of the fingers were bare in several places. In short he was the most severely burnt of any patient who ever came under my care.

“ Nothing had been done to him before I saw him, as he had only just been brought home. He had frequent shiverings; and, although a very resolute man, complained much of pain, and thought he must have been injured in his lungs, from the sense of heat he felt there, and from the bad taste in his mouth.

“ There was some strong gin and water on the table when I went in, and I immediately gave him a large tumbler glass full of it. I warmed some oil of turpentine, by holding a cup of it in boiling water, and I directed the attendants to bathe him assiduously with it, by means of probes armed with lint, and dipped into the spirit. This was continually done while I was employed in spreading plasters, (viz. ung. resin. flav. c. Ol. Terebinth) and the poor man found much relief from it. He however complained much of his hands, which were very painful, and smarted at the time of the application, but soon had

had a much easier feel. I applied the plasters to every part where I suspected the fire to have reached, gave him another glass of strong gin and water, to which I added sixty drops of laudanum, and I desired he should have more of the spirit if the shiverings should recur.

“ In the evening I found him tolerably easy, and, considering his situation, wonderfully so.—He had been my patient fourteen years ago, when he had been pretty much burnt, although not near so severely as at this time ; and had then been treated with ol. lin. c. aqua calcis, to which a portion of the tinct. opii. had been added, and he remarked, “ *that the fire, he thought, seemed likely to be killed sooner now than before.*” He had taken gin and water only once since morning, when he had a return of the shivering, and his attendants had moistened the plasters with Ol. Terebinth at his own request, from the relief he thought he felt from it. I gave him sixty drops of laudanum in a little spirit and water, to be taken at bed-time.

“ In the morning I found he had passed a tolerable night : I removed the plasters, and found some slight appearances of suppuration, particularly on the face, where a lardaceous appearance had taken place, but of a black colour from the coal-dust. I bathed the burnt parts again with the Ol. Terebinth. renewed the dressings, and allowed him gin and water, to be taken when shivering (which now and then threatened him) should occur. At night he took sixty drops of laudanum ; his bowels kept open, and he made no complaint of pain except in his hands.

“ Third day.—There is a tolerable suppuration on the face, neck, body, and legs. The blackness, from the coal-dust which appears to be firmly attached to the cutis, is separating fast, in the form of black lard. He remarks, *that the fire is killed every where but in his hands.* He was dressed with ung. resin. flav. with a less proportion of Ol. Terebinth. He is forbid the use

of spirits, but allowed porter as far as three pints in the 24 hours, if he chuses so much. His anodyne is continued.

“ Fourth day.—The suppuration in the face, body, and legs goes on well, and several parts are now turning florid, as the blackness disappears. The scorched parts have neither blistered nor run into suppuration. There is a large discharge of thin ichor from the hands; and on some parts of the fingers there is still a thick gelatinous matter adhering. His allowance of porter is continued. He has no shiverings. Dressings are changed for cerat. e lapid. calamin. Anodyne continued.

“ Fifth to the eighth day.—Going on well;—treatment continued;—bowels open;—allowance of porter diminished to a pint and a half per day.

“ Ninth day.—Suppuration large;—all the blackness gone off;—discharge from the hands still thin, and in great quantity, attended with much pain. Prepared chalk, finely powdered, is ordered to be sprinkled on all the sores, covering it with cerat. e lap. calamin. spread on rags. He is to take five grains of calomel at night, and to have a purge in the morning.

“ In the afternoon I was suddenly sent for to him:—The pain in his hands was intolerable, and he had two smart shivering fits. Having never before seen chalk applied, I attributed the pain to its use, but on taking off the dressings, I found my assistant had not applied any of it to the hands. He had used it liberally to the face, neck, body, and legs, and these parts were *perfectly easy*. I ordered emollient poultices to be applied to the hands and arms, and renewed every eight hours. The chalk was continued to the other parts.

“ Tenth and eleventh days.—The treatment continued. Pus on the face, neck, and legs of good consistence, and no pain in these parts. The hands are easier after the poultices are first applied, but soon become so painful as to make him urgent for a renewal of them; and when they are taken off, the discharge
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of thin matter pours from them. Finding the chalk agree so well with the other parts, I sprinkled his right hand freely with it, and covered it with the cerate plasters. He felt, as he said, a little tingling from the application, and wished to have the poultice continued to the left hand. I was glad of the opportunity of making this comparative trial, and allowed it to be so.

“Twelfth day.—Head, neck, and legs much better ;—loins nearly healed. I speak within bounds, when I say four square inches of skin have been beautifully formed on one leg since yesterday. I know no term which will give so good an idea of this process as *icing over* ; the extent covered, and the smooth shiny appearance being so like an icy pellicle formed on a smooth piece of water.

“Fifteenth day.—Face and legs mending fast ;—loins well ;—his hands completely raw, and bleeding from every point ;—the poultice on the left hand is deluged in thin matter, and this hand is by far the most painful. The right hand covered with the chalk, although painful, is not nearly so much so as the left, and the man is anxious to have the chalk applied to it, which is allowed ;—anodyne continued ;—five grains of calomel at night, and a smart purge to be taken early in the morning.

“Sixteenth day.—Has had two copious evacuations from the calomel and purging powder ;—every part better ;—the left hand much easier, but the granulations much looser than the right ; they bleed more readily, and are more painful.

“Seventeenth day.—One leg quite skinned over ; face and other leg much better.

“Twenty-first day.—The face and neck quite skinned over, except a small part of each eye-lid, and the nose ;—right leg almost healed ;—right hand skinned over from above the wrist to the ends of the fingers on the inside, and much better on the back part ;—left hand, to which the poultice had been so long applied, begins to grow better, but is far behind the other, so

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as to give a most decided preference to the chalk. He is now so well that I have allowed him to go into his garden.

“ You see, my dear sir, that I have been tediously circumstantial in my account of this case. I now deem my patient so near well, that I shall discontinue my journal; and I have only to add, that I have been so particular in the recital of the treatment, because perhaps you may have no case which furnishes such a fair opportunity for comparing your method with others commonly used. The poor fellow had felt the old method with oil, &c. and was therefore well enabled to appreciate the present plan, especially as he is a man of great resolution, and of strong natural sense. You have also had frequent opportunities of seeing him during the cure, and of convincing yourself of the truth of every circumstance. And I think the trouble you have had in rescuing this important branch of practice from the rude hands who so long held it, will be well repaid, were it only with the reflections this case will give you.—As a memento of my sense of the obligations the profession have to you, and to shew, as my poor patient says, there was *ne bairn’s play in this burn*, I will beg your acceptance of a preparation I have made of the skin and nails.

“ I am,

“ DEAR SIR,

“ Very sincerely, yours,

“ FREDERICK HORN.”

There still remain some parts to heal in the above case, and I have no doubt Mr H. will see, in the subsequent part of the cure, the benefit of cathartics.—I have a pleasure in adding the opinion of Mr Nelson, of Chester-le-Street, in the county of Durham, who has had very extensive practice
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in burns in the collieries on the river Wear :—he says, when the sores have taken upon themselves the ulcerous disposition, nothing but *repeated purging* at due intervals has succeeded in enabling him to finish the cure.

Having thus developed the principles, and detailed the practice in injuries of this class, from the point of health through the circle of diseased actions, till we again arrive at health, the subject appears to be nearly exhausted ; I shall therefore at present take my leave of the reader.

FINIS.

ERRATA.—In page 74, for *colloquitive*, read *colliquative*.
In page 77, for *julep*, read *jalap*.

